

§ mammals.

*The Library of the
Smithsonian Institution
for the Editor.*

GLEANNINGS

FROM

THE MENAGERIE

AND

AVIARY

AT

KNOWSLEY HALL.

"

Gray, J. G.
"

HOOFED QUADRUPEDS.



KNOWSLEY:

1850.

[PRINTED FOR PRIVATE DISTRIBUTION.]

fol
46
G779
v.2
RB
SI

P R E F A C E.

THE following Plates are selected from the series of Drawings of Ungulated Quadrupeds made by Mr. WATERHOUSE HAWKINS for the Right Honourable the EARL OF DERBY, chiefly from the animals living in his Lordship's Menagerie at Knowsley Hall. They have been lithographed by Mr. W. HAWKINS, and coloured, or printed in colours, under his superintendence.

The Plates are accompanied by LORD DERBY's notes on their habits, and by a brief description of the specimens of the various Genera, chiefly derived from the study of the animals at Knowsley, or in the British Museum.

It was intended that the Antelopes should have appeared by themselves, in the year 1847, to be followed by the other Families; but they were delayed by circumstances over which I had no control; and the whole series of the Plates now appear at the same time.

JOHN EDWARD GRAY.

BRITISH MUSEUM,

August 1, 1850.

GLEANNINGS.

ANTELOPES.

THE systematic arrangement of the Hollow-horned Ruminants (*Bovina*) has been one of the most difficult subjects for the student of Mammalia. Before I proceed to the arrangement proposed, it appears desirable that some examination should be given to those which have been in use.

Linnæus, in his last edition of the 'Systema Naturæ' (i. 27), divides them into three genera, according to the direction of the horns, which he describes as erect in *Capra*, reclinate in *Ovis*, and porrect in *Bos*, and separates these from *Cervus*, because they have tubular, while that genus has solid, branched and deciduous horns. Gmelin in his edition adds to these the genus *Antilope*, which had been established by Pallas, and characterizes that genus as having solid horns like the *Cervi*, but simple and persistent. Now I need scarcely observe that these characters will not define the genera, for all Goats have not erect horns, if any have, and it is the same with the other genera; and we all know that the Antelopes have tubular horns, in the sense that word is used by Linnæus, as much as the Oxen, Sheep and Goats; but this error of Gmelin has had its influence up to this time, for the horns of Antelopes in the first and last editions of Cuvier's 'Règne Animal' are described as having "the nucleus of the horn solid, and without pores or sinuses, like the horns of the Stags."

M. Geoffroy, perceiving that the characters furnished by Linnæus were not sufficient to separate the Antelopes from other genera, examined the structure of the prominences of the frontal bones which form the core or support of the horns of the Antelopes, and he describes the core of the horns of the Antelopes to be solid and without sinuses, while he characterizes the cores of the horns of the Goats, Sheep and Oxen as in great part occupied with cells which communicate with the frontal sinus, and Cuvier, Latreille and most authors have, without re-examination, adopted these characters.

Some years ago I examined the cores of the horns of many species of Antelopes for Colonel H. Smith, and found they were all more or less cellular within, and these cells had a communication with the frontal

sinus; certainly the cells are not so numerous as in the thick horns of some Oxen, but they are quite as numerous for the relative size of the core; and it is to be remembered that the general character of the horns of Antelopes is to be slender and elongated, consequently there is not so much room for cells, as their presence would destroy the strength of the core, so as not to form a fit support for the horns. Thus this character is merely reduced to one dependent on the small size or slenderness of the horns, which though usual is not universal in the genus, for example, in the *A. Oreas* and others.

Colonel Smith, aware of this difficulty, divided these animals into two families,—*Capridæ*, characterized by having the horns “vaginating upon an osseous nucleus totally or nearly solid,” containing the genera *Antilope*, *Capra*, *Ovis*, and a new genus which he called *Damalis* for the Antelopes with high withers; and second, the family *Bovidæ*, with the horns “vaginating upon a bony nucleus, not solid, but more or less porous and cellular,” including the genera *Catoblepas* or Gnu, *Ovibos* or Musk Ox, and *Bos**. This arrangement shows that much reliance is certainly not to be placed on M. Geoffroy’s character for the genus *Antilope*, for here the Goat and Sheep are said to have the same peculiarity as he gives to separate the Antelopes from them.

Several authors after this period considered the subgenera proposed by De Blainville and Colonel H. Smith as genera, and divided them into families.

Mr. Ogilby, in a theoretical arrangement of Ruminants, published in the ‘Proceedings of the Zoological Society’ for 1836, divides these animals into two families, characterized thus: *Capridæ*, “muffle none;” *Bovidæ*, “muffle distinct, naked.” Of this arrangement I need only remark, that he places *Ovibos* in *Capridæ* and *Bos* in *Bovidæ*, *Kemas*, or the Jemla Goat, in *Bovidæ*, and *Capra* in *Capridæ*, thus separating into distinct families most nearly allied species; while the genus *Ixalus*, which is an Antelope with rudimentary horns, is referred to the family *Moschidæ*, and the Gnu is entirely overlooked. I am satisfied, if Mr. Ogilby had attempted to arrange a collection by this system, he must have soon abandoned it.

Within the last few years, Professor Sundevall of Stockholm has proposed to arrange these animals according to the form of their hoofs, and he has regarded the subgenera of preceding authors as genera, and divided them into four families, thus:—1. *Caprina*, containing *Ovis*, *Capra*, *Nemorhedus* and *Oreotragus*; 2. *Antilopina*, containing *Antilope*, *Dicranoceras* and *Bubalus*; 3. *Bovina*, containing *Oryx*, *Catoblepas*, *Ovibos*, *Bos*, *Anoa*, *Portax* and *Damalis*; 4. *Sylvicaprina*, containing *Hippotragus*, *Strepsiceros*, *Cervicapra*, *Calotragus*, *Nanotragus*, *Neotragus*, *Sylvicapra*, *Tragelaphus* and *Tetracerus*. In this arrangement he appears to have overlooked the fact, that the hoofs of these animals are modified according to the kind of country which the animal is destined to inhabit, and therefore this arrangement is dependent on that single circumstance, and not on the consideration of all the peculiarities of the species: hence the species which inhabit rocky pinnacles, as the Thar and Ghoral (*Nemorhedus*), and Klipspringer (*Oreotragus*), are separated from the other Antelopes and placed with the Goats, and the large and heavy Antelopes which inhabit the plains, as the *Oryx*, *Portax* and *Damalis*, are placed with the Oxen.

If this system is fully carried out, the Rein Deer should be separated from its allies and placed with the Musk Ox, and I am not certain that the *Addax* Antelope should not be arranged in the same group, for it has the same shaped hoofs, the sands of the Desert probably requiring the same structure for progression as the snow.

After examining all these arrangements, and after repeated examinations of the animals, I believe that the form of the horns affords the most natural character for subdividing them into sections, and I think that if the Antelopes of Pallas are divided into two groups, which appear to me natural, then there is no difficulty in finding neat characters for the definitions of these families.

1. Those with round or slightly compressed horns, without any ridge in front; as

The OXEN (*Bovæ*), which have smooth, subcylindrical, or rather depressed horns, bent out on the side of the frontal, a heavy body and strong legs, with the knee below the middle of the fore-leg; as the genera *Bos*, *Bibos*, *Bison*, *Bubalus*, *Anoa*, *Poephagus* and *Ovibos*.

The ANTELOPES (*Antilopeæ*), which have ringed, subcylindrical or rather compressed, slender horns, erect (or more or less bent back) from the front of the forehead, the face of the skull moderate, proportionate to the brain-cavity, which is narrowed behind, and the knee near the middle of the fore-leg.

2. Those which have subangular horns, with a more or less distinct ridge or keel on the inner side of the front. They have the knee in the middle of the fore-leg; as

The STREPSICERES (*Strepsicereæ*), which have subangular, slender, erect, subspiral horns from the front of the forehead, and the proportionably formed skull, beautifully formed head and light limbs of the Antelopes; as the genera *Portax*, *Strepsiceros*, *Boselaphus* and *Tragelaphus*. They are peculiar for having a spotted or striped body.

The GOATS and SHEEP, which have a small face in proportion to the brain-cavity in the skull, and thick legs and heavy bodies.

* I may remark that Cuvier says that the genus *Bos* has a large naked muffle; yet two species which he refers to it have a hairy muzzle like the Sheep, viz. *B. grunniens* and *B. moschatus*.

The GOATS (*Capreæ*) have, generally, triangular, compressed, erect, recurved or twisted horns. The males always emit a strong odour; as *Capra*, *Ibex* and *Hemitragus*.

The SHEEP (*Oveæ*), on the other hand, have subquadrangular, heavy, ringed, recurved, spirally involute horns, bent outwards, and their males are inodorous; as the genus *Ovis*.

Mr. Burchell observes, that all the Antelopes, including the Gnu, pass their food as do the Sheep and Deer, in small pellets. The Gnu, in the 'Dict. Sci. Nat.' ii. 248, is said to have the folded excrement of a Cow.

The Antelopes, as defined in the foregoing character, contain a large number of species separated into several genera, which may be arranged in the following sections:

I. The ANTELOPES OF THE FIELDS have a tapering nose, with the nostrils bald within.

1. The TRUE ANTELOPES are light-bodied and limbed, and small-hoofed, with a short or moderate tail covered with elongated hair to the base; horns lyrate or conical.

2. The CAPRINE ANTELOPES are heavy-bodied and limbed, and large-hoofed, with a very short, depressed tail covered with hair to the base; horns conical.

3. The CERVINE ANTELOPES are large-sized, rather heavy-bodied and large-hoofed, and have an elongated tail with short hair at the base and tufted at the end.

II. The ANTELOPES OF THE SANDY DESERTS have a broad nose, and the nostrils lined with bristles within.

4. The EQUINE ANTELOPES have the nose very broad, soft, spongy, and bristly.

5. The BOVINE ANTELOPES have the nose moderately broad, with a black, moist muffle.

I shall now proceed to the consideration of the genera and species.

The TRUE ANTELOPES have a tapering nose, the nostrils bald within, close together in front and diverging behind; a moderate-sized elegant body and slender legs; a moderately elongate, hairy tail; and the horns placed over the eyebrows.

* Some of these have lyrate (or rarely cylindrical, subspiral) horns, strongly ringed at the base, an ovine nose, without any naked muffle, deep inguinal pouches, and generally a well-developed tear-bag in front of the eyes.

1. SAIGA,

with short, strong, lyrate, white horns; a compressed, very high, rounded nose; tear-bag distinct; fur soft.

The COLUS or SAIGA. *Saiga Tatarica*.

Pale yellowish, crown and back greyish washed; young, crown greyer.

Capra Tatarica, Linn. S. N. 97.—*Antilope Saiga*, Pallas.—*Ibex imberbis*, Gmelin.—*Antilope Colus*, H. Smith.—*Colus Strabonis*, Gesner.

Inhabits Siberia. Cab. Brit. Mus.

2. KEMAS,

with elongated, rather lyrate horns; nose with a dilated pouch on each side; tear-bag distinct? hair close, erect, spreading.

The CHIRU. *Kemas Hodgsonii*.

Pale brown; chest, belly and inside of the limbs white; front of face and front of legs blackish.

Antilope Hodgsonii, Abel.—*A. Kemas*, H. Smith (not horns, t. 181. f. 6).—*A. Chiru*, Lesson.

Inhabits Thibet. Cab. Brit. Mus.

3. GAZELLA (*H. Smith*),

with strong, lyrate, black horns; the face tapering; nose simple; tear-bag distinct. Females hornless or with smaller horns; teats four.

* Hair very long, especially about the head and mouth; knees not tufted: females hornless.

The DSEREN. *Gazella gutturosa*.

Pale yellowish; hair long, soft.

Antilope gutturosa, Pallas.—H. Smith.

Inhabits Siberia. Cab. Brit. Mus., male and female.

** *Hair close-pressed; knees with tufts; back and rump brown, vent white: females with slenderer horns.*

† *Lower part of side with a dark oblique streak; feet with a tuft of black hair beneath.*

THE GAZELLE. *Gazella Dorcas*. TAB. III.

Fur rather elongate and harsh, grey brown; outside of fore legs, broad oblique streak along the side, edge of anal disc, front of face and face-streak dark brown; face-streak, throat, chest, belly, inside of thigh and anal disc white; tuft at underside of feet and end of tail black; knee-tufts blackish; young, back and side-streak rather paler.

Var. Nose with a dark spot or streak.

Var. Larger, legs thicker. TAB. III.

Capra Dorcas, Linn. — *Antilope Dorcas*, Pallas. — Licht. 3. t. 5. — *A. Gazella*, Pallas. — *Gazella Kevella*, H. Smith, ♀. — *G. Corinna*, H. Smith, ♀. — *Gazelle*, Buffon, H. N. xii. t. 22—25. ♂. — *Kevel*, Buffon, H. N. xii. t. 26. ♂. not F. Cuvier. — *Corinne*, Buffon, H. N. xii. t. 27. ♀. t. 30 (not F. Cuvier). — Cuvier, Menag. Mus. t. . — *Kevel gris*, F. Cuvier, Mam. Lithog. t. 3. — *Antilope Cora*, H. Smith. — *A. Arabica*, Hemprich and Ehrenb. Symb. Phys. t. 5. — Licht. Saugth. t. 6. — *A. Cuvieri*, Ogilby, Frazer, Zool. Typica, t.

Inhabits N. Africa; shore of Red Sea; Mogador (*Wilshire*).

The British Museum has five males, two females, and two kids.

The Earl of Derby has specimens (here figured) which he calls *Gazella vera*; they are rather larger, greyer, and the legs are much thicker and heavier than the specimens from the shore of the Red Sea. The fur is similar, but not quite so long on the underside of the neck. The *Kevel gris* (F. Cuvier, Mam. Lith.) well represents this variety.

The *A. Cuvieri* of Ogilby, from Morocco, is a much larger animal than the common *G. Dorcas*, but agrees with it in other characters, except, it is said, in having longer ears.

M. F. Cuvier (Mam. Lithog. vii. t. 8. ♀.) has figured and described an Antelope from Sennaar under the name *A. leptoceros*, which he says is very like *A. Dorcas*, but has larger horns, those of the males being twice and of the females half as long again as the head. The horns vary greatly in length in our specimens.

†† *Upper part of sides with a pale streak.*

THE ISABELLA GAZELLE. *Gazella Isabella*.

Fur short, very soft; pale yellowish-brown, with a broad, rather paler oblique streak on the upper part of the side; knee-tufts, front of face and lower face-streak darker, yellow brown; upper face-streak, chest, back edge of tarsus, underside of feet, inside of limbs, belly and vent white; tail black. Female, horns very slender, longer than the head. Young paler, the lower part of the sides rather darker.

Gazella Isabella, Gray, Ann. and Mag. Nat. Hist. 1846.

Inhabits N. Africa; Egypt (*J. Burton, Esq.*), Cordofan (*Sundevall*).

This species is easily known from the foregoing by the softness and fineness of the fur, and the lower side-streak being of the same colour as the back, and from it and the following by having no dark edge to the anal disc.

THE JAIRON. *Gazella subgutturosa*.

Pale brown; upper part of sides with a broad, rather paler streak; crown and knee-tufts greyer; face-streak indistinct; nose, lower part of sides, belly, hinder side of fore and front side of hinder limbs and anal disc white; streak on haunches dark brown; end of tail blackish.

Antilope subgutturosa, Guldenst. — Pallas. — H. Smith, Griff. A. K. t. 183. f. 5. horns.

Inhabits Siberia. Cab. Brit. Mus.

Larger than the Chikara.

††† *Sides uniformly coloured.*

THE CHIKARA. *Gazella Bennettii*.

Bay brown; knee-tufts, end of nose and tail black; streak on haunches blackish; face-streak, chest, belly and inside of limbs white.

Antilope Bennettii, Sykes. — *A. Christii*, Gray. — *A. Bharatensis*, Hodgson. — *A. Hazenna*, I. Geoff., Voy. Jacq. Mam. t. 6. bad?

Inhabits India. Cab. Brit. Mus.

The feet are generally blackish, but sometimes brown, like the back.

*** *Hair adpressed; knees with tufts; rump mark and throat-spots white: females with slender horns; no dark side-streak; tail slender, compressed, only hairy above (Dama, Bennett).*

The ABYSSINIAN MOHR. *Gazella Soemmeringii*.

Pale brown; nose, forehead and lower edge of face-streak and end of tail blackish; chest and belly, angular mark on rump above the tail, face-streak and spot on the throat white; limbs pale. Female, forehead paler in the centre.

Antilope Soemmeringii, Ruppell, Zool. Atlas, t. 19 ♂.

Inhabits Abyssinia. Brit. Mus.

The MOHR. *Gazella Mohr*.

Bay; chin, spot on throat, chest, belly, edge and inside of limbs and angular spot on rump above the tail white; spot on side of face and end of tail black.

Antilope Mohr, Bennett, Trans. Zool. Soc. i. t. 8.—Knight, M. A. N. f.

Inhabits Morocco. Mus. Zool. Soc. Portendic called *Seni-ci* (Mr. Whitfield). Mus. Brit.

The specimen in the Frankfort Museum, which was received from the Zoological Society, is one-third smaller than the *Andra*. It is brown, rump mark, lower part of the sides, belly, inside and edge of legs white, face iron-grey with longer hair at the base of the horns; horns large, thick, the face-streak indistinct from the pale colour of the head.

There is a fine specimen of this species living at Knowsley, and a female which died on the passage in the British Museum.

The NANGEUR. *Gazella Dama*.

Bay; chin, spot on throat, belly, lower part of sides and hinder part of the back, inside of the limbs white; no spot on side of the face.

Antilope Dama, Pallas.—*A. rubra*, Afzelius.—*Nangeur*, Buffon, H. N. xii. t. 32. f. 3. t. 34.

Inhabits W. Africa; Senegal.

Not seen since Buffon's time; may be a bad figure of the former.

The ANDRA. *Gazella ruficollis*.

Whitish; neck and front part of the middle of the back reddish; no face-streak.

Antilope ruficollis, H. Smith, G. A. K. v. 205.—*A. Andra*, Bennett.—*A. Dama*, Licht. Saugth. t. 3, 4.—Ruppell, Zool. Atlas, t. 14, 16.—Ehrenberg, Symb. Phys. t. 6.

Var. Young? with an indistinct narrow brown streak across the outside of the thighs, and the forehead iron-grey, with longer hair at the base of the horns; horns small. Mus. Frankfort.

Inhabits North Africa; Kordofan. Brit. Mus. ♀.

These species differ in size as well as markings. The *Mohr* and *Andra* differ from *G. Soemmeringii* in being of much larger size, and in wanting the black face and streaks. Bennett's *Mohr* has only an angular white spot on the rump, like *G. Soemmeringii*; Buffon's *Nangeur* is smaller and has more white on the rump, thighs and sides; and the *Andra*, which agrees with the figures cited, is almost all white, with a reddish neck and withers.

**** *Hair close-pressed; knees without tufts (but with rather longer hair, forming a linear keel in front); back and rump brown: females with slender horns; sides with dark streak.*

The KORIN. *Gazella rufifrons*. TAB. IV.

Bay brown; sides above paler, with broad dark streak below; tail black; chest, belly, inside of legs, back edge of tarsus, and underside of feet and anal disc white; face bright bay, side-streak broad white.

Gazella rufifrons, Gray, Ann. and Mag. Nat. Hist.—*Kevel*, male, F. Cuvier, Mam. Lithog. t. 3.—*Corine*, F. Cuvier, Mam. Lithog. t. . young ♀.—*A. lævipes*, Sundevall, in letter Oct. 1846.

Var. Nose blackish above (adult ♀).

Young; pale yellowish, side-streak brownish.

Inhabits W. Africa; Senegal; Gambia (*Mr. Whitfield*), called *Seni*. Sennaar (*Sundevall*). Brit. Mus.

Buffon mentions a *Corine* as coming from Senegal, but he says it is smaller than the *Kevel*, and Daubenton says that it has knee-tufts, so that it cannot be this species. Indeed the *Gazelle*, *Corine* and *Kevel* of Buffon are clearly all *A. Dorcas* of this memoir.

The *Kevel* figured by M. F. Cuvier well represents this species. He says it was sent from Senegal, and probably it has not knee-tufts, for they are not indicated in the figure or mentioned in the text; for, like other descriptions of this author, though it occupies more than two pages, all the peculiarities of the species are left out. The *Corine* of the same author, also from Senegal, well represents the young. M. Cuvier says the *Kevel* and *Corine* and *A. Dorcas* form one species, but afterwards, under *Kevel gris*, he thinks they may be two.

***** Hair close-pressed; knees not tufted; back with an expansile white streak or fold: females with smaller horns; tear-bag not remarkably distinct. (*Antidorcas*, Sundev. MSS.)

The SPRINGBOC OR TSEBE. *Gazella Euchore*.

Pale brown; face, throat, chest, belly, broad expansile streak on back to base of tail, edge and inner side of limbs white; face-streak and middle part of forehead pale brown, side-streak oblique, dark brown: young paler; side-streak paler, back-streak distinct.

Antilope Euchore, Forster, Licht. t. 7.—H. Smith.—Harris, W. A. A. t. 3.—*A. saltatrix*, Link.—*A. marsupialis*, Zimm.—*A. Pygarga*, Blumenb.—*A. dorsata* and *A. saliens*, Lacep.—*A. Ibez*, Afzelius, 1810.

Inhabits S. Africa. Brit. Mus.

4. ANTILOPE (part *Pallas*), *ÆPYCEROS* (*Sundev. MSS.*),

with elongate, wide-spreading, lyrate, black horns; face tapering, nose simple; feet with tuft of (black) hair near pastern; teats two; no trace of suborbital sinus (*Harris*).

The PALLAH OR ROOYE Boc. *Antilope Melampus*.

Bay, sides paler beneath; belly, anal disc and lower side of tail white; crown, anal streak and tip of tail blackish; tuft above feet and back of feet black.

Antilope Melampus, Licht.—H. Smith, t. 181. f. 7.—Harris, W. A. Africa, t. 15.

Inhabits S. Africa.

5. CERVICAPRA, ANTILOPE (*H. Smith*),

with elongate, subspiral, erect, diverging horns; face tapering, nose simple.

The ANTELOPE. *Cervicapra bezoartica*.

Grey brown; lips, orbits, chest, lower part of sides and belly, edge and inside of limbs white; nose, front of shoulder and outside of thigh, end of tail and front of feet blackish; neck redder.

Capra bezoartica, Aldrov.—*C. Cervicapra*, Linn., ? H. Smith.—*A. Cervicapra*, Pallas, Gray, Illust. Ind. Zool. t. .—*Antilope*, F. Cuv. Mam. Lith. t. . ♀.

Var. and young. A narrow pale streak on the upper part of each side.

Antilope bilineata, Temm., Gray, Illust. Ind. Zool. t. .

Inhabits India. Brit. Mus.

This species has bred once at Knowsley: the young is now nearly as large as the mother; the female (Oct. 1846) is again with kid.

** Others have small, slender, straight, conical, tapering, more or less diverging horns, which are often bent forward at the tip; the muffle is generally large and moist.

† Some, like the preceding, have a large tear-bag, but they generally have a large muffle.

6. TETRACERUS (*Leach*),

with large muffle; tear-bag large, longitudinal; horns, two pair very short, conical, straight; knee-tufts none: female hornless.

The CHOUKA. *Tetracerus quadricornis*.

Front pair of horns conical, distinct.

T. quadricornis, H. Smith, G. A. K. t. 181. f. 3. t. 186.—*Antilope quadricornis*, Blainv.—*A. striaticornis*, Leach.—*A. tetracornis*, Hodgson.—*A. Chickara*, Hardw.—H. Smith.—*Cervus albipes*, F. Cuv. Mam. Lith. t. . ♀.
—*T. Chicara*, F. Cuv. Mam. t. . ♂.

Inhabits India, Himalaya. Brit. Mus.

M. De Blainville in describing this animal has read *Moorshadabad*, the habitat for *Hoornadabad*, and thought it the name of the animal.

The JUNGLIBUKRA. *Tetracerus subquadricornutus*.

Front pair of horns rudimentary, tubercular; hinder horns conical, subcylindrical; pale brown; side rather paler; chest, belly, inside and front of legs whitish; feet paler, varied.

Var. Female, front of legs blackish.

Antilope subquadricornutus, Elliot, Madras Jour. 35, t. 4. f. 2.—*Brown Antelope*, Sykes.

Inhabits Madras. Larger than the former. Brit. Mus.

7. CALOTRAGUS (part *Sundevall*), OREOTRAGUS (part *Gray*), REDUNCA (part *H. Smith*),
TRAGULUS (*H. Smith*),

with large muffle; tear-bag arched, transverse; horns subulate, elongate, erect; hoofs triangular, flattish beneath, acute in front; crown smooth; tail very short; groin and orbit nakedish: females hornless; teats four; the knees not tufted; inguinal pore none; ear elongate; false hoof small or none.

The STEINBOC. *Calotragus Tragulus*.

Fulvous, ashy; hair uniform; small spot on nose, and two diverging streaks on crown to nape blacker; upper part of throat, chest and abdomen white; ears three-fourths the length of the head; false hoofs none.

Antilope Tragulus, Forster, Licht. t. 14.—*A. rupestris*, H. Smith.—Harris, W. A. A. t. 25. f. 2.—*A. Capensis*, Thunb. 1811.—Afzelius, 1815.—*A. pallida*, H. Smith.—*A. Pediotragus*, Afzelius.—*A. fulvo-rubescens*, Desmoul.—*A. rufescens*, H. Smith, G. A. K. t. 188.

Var. Without the black crown-streaks, throat whiter.

Inhabits S. Africa. Brit. Mus.

This species varies much in colour, perhaps according to the season: sometimes the hairs are whitish at the tip, giving the fur a glaceous appearance; the black streaks are as distinct in the young as in the adult.

The GRYS BOG. *Calotragus melanotis*.

Red bay, with intermixed white hairs, crown with two dark streaks; ears two-thirds the length of head; false hoofs small.

A. Melanotis, Thunb. 1811.—Afzelius.—Licht. S. t. 12.—Harris, W. A. t. 26.—*A. grisea*, Cuvier, D. S. N. ii. 244. 1816.—H. Smith.—*A. rubro-albescens*, Desmoul.

Var. pallida. Pale ashy white, hairs some white, others lead-coloured with grey tips. Brit. Mus.

Inhabits S. Africa. Brit. Mus.

8. SCOPOPHORUS (*Gray*), CALOTRAGUS (part *Sundevall*),

with small bald muffle; transverse tear-bag; horns subulate, elongate, acute, slightly recurved at the tip; knees largely tufted; inguinal pores distinct and bearded; ears moderate, with a naked spot on the outside of their base; hoofs triangular, false hoof distinct.

The OUREBI. *Scopophorus Ourebi*.

Temple-spot small, indistinct; fur red brown; cheeks paler; crown darker red brown; orbits, chest, belly, and middle of upper part of inner side of legs white; end of tail, arched line before the eye and spot between the ears black.

Var. End of nose blackish.

A. Scoparius, Schreb. Licht. S. t. 13.—*A. Ourebi*, Shaw.—Lesson.—*Ourebi*, Buffon, not F. Cuvier.—*A. melanura*, Bechst.

Inhabits S. Africa, Cape of Good Hope. Brit. Mus.

The GIBARI. *Scopophorus montanus*. TAB. V.

Temple-spot large, deep (more than half an inch over), naked; fur greyish brown; cheeks paler; crown red brown; orbits, chest, belly, underside of tail and middle of the inner side of the upper parts of the legs white; end of tail and arched line before the eye black.

Antilope montanus, Ruppell, Zool. t. .

Inhabits W. and E. Africa; Abyssinia (*Ruppell*); Gambia. Called Gebari, or Mahomet's Antelope (*Earl of Derby*). Brit. Mus.

Very like the former, but grey brown, and the temporal spot much larger, deeper, more distinct and bald, both when alive and in the skin, so that it does not depend on the stuffing.

9. OREOTRAGUS (*Gray, Sundevall*), TRAGULUS (*H. Smith*, not *Pallas*),

with large muffle; tear-bag arched, transverse; horns subulate, elongate; hoofs squareish, high, compressed, much-contracted, concave beneath; false hoofs large, blunt; crown smooth; tail very short; hair thick, quill-like, spread out: female hornless; teats two.

The KIANSI OR KLIPPSPRINGER. *Oreotragus saltatrix*.

Dark brown, yellow grised; hair grey, brown at the end, with a short yellow tip; beneath whitish; edge of ears and feet above the hoofs black.

Antilope Oreotragus, Forster.—H. Smith.—Licht. S. t. 15.—*A. saltatrix*, Bodd.—Harris, W. A. A. t. 24.

Inhabits South Africa; Abyssinia (*Ruppell*). Brit. Mus.

Varies in brightness and depth of colour according to the season.

10. NESOTRAGUS (*Von Duben, Sundevall MSS.*),

“with large bald muffle; deep, large lachrymal sinus; face and forehead not crested; ears large; large horns in males, and no false hoofs.

Very like *Neotragus* in form and character.

The NESOTRAGUS. *Nesotragus moschatus*.

Nesotragus moschatus, Von Duben (*Sundevall MSS.*), size and nearly the colour of *Neotragus Saltiana*.

Inhabits Zanzibar, east coast of Africa. Male and female in the Stockholm Museum.”

11. NEOTRAGUS (*H. Smith*), MADOQUA (*Ogilby*),

with no muffle; nose ovine; tear-bag roundish; tail very short; crown crested.

The MADOQUA. *Neotragus Saltiana*.

Antilope Saltiana, Blainv.—*A. Hemprichianus*, Ehrenb. S. P. t. 7.—Licht. S. t. 16.—*Neotragus madoka*, H. Smith.

—*A. Grimmia*, Ruppell.—*A. Hemprichii*, Ruppell, Abys. 25.

Inhabits Abyssinia. Brit. Mus.

†† Others have a glandular line on the side of the face, in the place of the tear-bag; and the muffle large and bald.

12. CEPHALOPHUS (*H. Smith*), SYLVICAPRA (*Ogilby, Sundevall*),

with large muffle; tear-bag none, but a naked, glandular line, formed of two series of pores, on the side of the cheek; crown crested, ending in a tuft between the horns.

* “Knees and hind legs tufted; ears and horns elongate; tear-bag small, under the eye, and a narrow naked streak on cheek.”

The FOUR-TUFTED ANTELOPE. *Cephalophus? quadriscopa*.

“Buff, paler on the sides; tail, knee-tufts, front of nose, narrow inferior lateral and anal streak and streaks across legs blackish; lips, breast, belly, inside of limbs, vent and houghs white.”

Antilope quadriscopa, H. Smith, G. A. K. iv. 261. t. 188.

“Inhabits Senegal.”

This species is only known from Colonel H. Smith’s description and figure.

** Knees not tufted; ears elongate acute; horns slender, elongated.

The IMPOON OR DUYKER OR DUYKER BOE. *Cephalophus Grimmia*.

Yellowish brown, greyish in winter; hair yellowish, with blackish tip; forehead yellowish bay; inside of ears, chin, throat, abdomen and under side of tail white; feet, streak on the nose, up the legs, and upper part of tail black; ears elongate, nearly as long as head, acute; horns black, elongate, slender, base rugose and subangular in front.

Moschus Grimmia, Linn. S. N. (ed. 10) 70; *Antilope Grimmia* (ed. 12).—*A. mergens*, Blainv. Bull. Soc. Phil.

1817.—H. Smith, G. A. K. v. 264.—Licht. Saugth. t. 11.—Harris, W. A. Afr. t. 15.—*A. nictitans*, Thunb.

Mem. Petersb. 1811. iii. 312.—*A. Burchellii*, H. Smith, G. A. K. v. 262. adult in summer?—*A. Ptoox*,

H. Smith, G. A. K. v. 265? jun.?—*A. Platous*, H. Smith, G. A. K. v. 266.

Inhabits S. Africa. Brit. Mus.

This species varies greatly in the intensity of the colours and in the extent of the black on the feet and nose. In one young specimen in the British Museum the black on the nose is quite deficient; though it has the bright colouring of the breeding-season, and is bright bay on the crown.

The specimen in the Museum of the London Missionary Society (No. 8 Bloomfield Street, Moorfields, formerly in Austin Friars), Case 5, described by Colonel H. Smith under the name of *A. Platous*, is the size and has the horns and ears of an adult *C. Grimmia*, but differs in being paler, and having no dark colour on the nose or feet; but it is evidently much bleached. It has certainly no relation to the *C. sylvicultrix*, with which Colonel Smith was afterwards inclined to place it as a variety (Syn. v. 344).

There are three species which have been called *Antilope Grimmia*:—

1. The *Capra sylvestris africana* of N. Grimm, Misc. Cur. Norimb. 1705. 131. t. 13, the authority for *Capra Grimmii*, Ray, Syn. 80, and Linn. S. N. (ed. 10) 70. *Moschus Grimmia*, Linn. S. N. ed. 12. from the Cape, of a dull grey colour. Probably the Duyker.

2. *Le Grimme* of Buffon, H. N. xii. 307. 329. t. 41. f. 2, 3, from a head sent from Senegal by Adanson; the *Antilope Grimmia* of Desmarest, F. Cuvier, and H. Smith, &c.; the *Cephalophus rufilatus*.

3. The *A. Grimmia* of Pallas, with large ears and a black streak to the horns, like *C. Campbelliæ*, but is from Guinea. I know of no species common to the W. and S. coast of Africa, so that it is probably yet to be distinguished.

The “*Fitomba*” or “*Philantomba*” appears to be the generic name of all the W. African *Cephalophi* or Bush Antelopes.

The BLACK-FACED PHILANTOMBA. *Cephalophus Campbelliæ*.

Grey and black grisled, beneath white; cheeks, neck and chest yellowish; forehead yellow, with a black streak on the nose widening on the forehead and ending in a tuft behind the horns; feet and front of fore-legs reddish black; fur soft; hair grey, with black ring and tip; ears elongate acute.

Antilope Grimmia, Pallas, Spic. Zool. xii. 18. t. 1?—*C. Burchellii*, var. (*C. Campbelliæ*), Gray, Cat. B. M. 162. —*C. Campbelliæ*, Gray, Ann. and Mag. Nat. Hist. 1846, 164.

Inhabits S. Africa. Brit. Mus.

We have an adult female of this species sent us as *A. mergens*, var. *Burchellii*, by M. Sundevall (the other specimen of the same name being a true Duyker), and a young specimen which has been in the British Museum for several years, sent from Africa, under the generic name of *Philantomba*, by Mrs. Campbell.

This species is at once known from the Duyker by being much darker and distinctly grisled or dotted, and the under side being much whiter.

The *A. Grimmia* of Pallas, Spic. Zool. i. 18. t. 3, which he describes as grey grisled, becoming brownish ash on the buttocks; throat, chest and beneath the body white; head and neck yellowish grey; a black streak between the horns, forming a fascia on the forehead and broader on the nose; fur softer than the Deer, but rough, of lower part of the neck rougher and more lax; feet and line on fore-legs blackish; tail black above; ears rather acute: inhabits Guinea; agrees in most respects with this species, but most probably is yet to be procured from W. Africa.

*** *Knees not tufted; ears moderate, acute; horns short, conical, thick.*

The ABYSSINIAN BUSH GOAT. *Cephalophus Madoqua*.

Yellowish brown, slightly punctulated with black; neck yellowish; limbs blacker; face-streak and feet black; hair rather rigid, close-pressed, reddish grey at the base, end polished yellow brown, with dark tips; forehead reddish.

Antilope Madoqua, Rupp. Abys. t. 7. f. 2.—Sundevall.—*Madoqua*, Bruce's Travels, vii. 360. t. 56.

Inhabits Abyssinia. Mus. Frankfort.

This species is very distinct from *C. coronatus*, being darker, and the fur more rigid and close-pressed.

The RED-CROWNED BUSH BUCK. *Cephalophus coronatus*. TAB. VI.

Pale yellowish brown; middle of back and front of fore-legs varied with a few scattered black hairs; crown bright bay; crest blackish brown, bay in front; feet and streak up the nose blackish; inside of ears, chin, throat, chest, belly and inner side of legs whitish; horns short, conical; ears about half as long as the head, acute.

Cephalophus coronatus, Gray, Ann. and Mag. Nat. Hist. x. 1842, 266. 1846, 164.

Inhabits W. Africa; Gambia, Macarthy's Island. Mr. Whitfield called it *The Coquetoan*. Brit. Mus.

There is an adult female in the collection of the Earl of Derby; a nearly adult male and two young females in the collection of the British Museum; the two latter were brought by Mr. Whitfield with the female before-mentioned and here figured.

**** *Knees not tufted; ears moderate, rounded; horns conical, thick; without any streak over the eyes.*

The WHITE-BACKED BUSH BUCK. *Cephalophus sylvicultrix*.

Blackish brown, minutely grised; hair brown, with whitish tips; back with a large yellowish white spot, narrow in front; throat, chest and belly redder; crown, nape and legs darker; horns —?

Antilope sylvicultrix, Afzelius, N. Act. Upsal. vii. 1238.—H. Smith, G. A. K. t. 187.

Inhabits Sierra Leone, in swampy places. Brit. Mus.

Varies in the size of the dorsal spot.

In the British Museum is a young male. Length 29 inches; height 18; tarsus 6·9.

The BLACK-STRIPED BUSH BUCK. *Cephalophus Ogilbii*.

Pale bay brown, with a deep black dorsal streak; beneath pale; crown and haunches brighter bay; neck and withers, and sides of the dorsal line varied with deep brown hairs; streak up the fore-leg, upper part of hock, feet (above the hoof) and end of tail blackish; horns short, thick, conical, very rugose on the inner front edges of the base.

Cephalophus Ogilbii, Gray, Ann. and Mag. Nat. Hist. 1842.—Frazer, Zool. Typ. t. —*Antilope Ogilbii*, Waterh. P. Z. S. 1838, 60. 1842, 129.

Inhabits Fernando Po (*J. Thompson, Esq.*). Brit. Mus.

A true *Cephalophus*, not half the size of the preceding.

The BAY BUSH GOAT. *Cephalophus dorsalis*. TAB. VII.

Dark bay; shoulders and legs darker; hair brown, a few on the haunches white-tipped; crown and nape, broad streak along the back to end of tail black; spot over each eye; lips, sides of chin, front of chest, underside of tail and inside of thighs pale brown.

Cephalophus dorsalis, Gray, Ann. and Mag. Nat. Hist. 1846, 165.

Inhabits Sierra Leone. Called *Bush Goat*. Brit. Mus.

In the British Museum there is a young male, brought to this country by Mr. Whitfield, which died in the Surrey Zoological Gardens. The head is very large, the skull short, broad, forehead rounded.

The BLACK BUSH BUCK. *Cephalophus niger*. TAB. VIII.

Sooty black, greyer in the front half of the body; chin, throat, abdomen and inside of thighs grey; forehead and crown dark bay and black mixed; cheeks pale brown and black varied; tail, end whitish.

Antilope niger, Mus. Leyden.—*Cephalophus niger*, Gray, Ann. and Mag. Nat. Hist. 1846, 165.

Inhabits Guinea. British Museum. Sierra Leone (*Mr. Whitfield*). Knowsley Museum.

In the British Museum there is a male from the Leyden Museum, nearly as large as the former.

The NATAL BUSH BUCK. *Cephalophus natalensis*.

Bright red bay; nape, withers and feet varied with dark grey hairs; nose-streak short, blackish; lips, chin, upper part of throat and end of tail white; lower part of cheeks, throat and abdomen pale yellowish; crown and tuft bright red; horns short, conical.

Antilope natalensis, A. Smith, S. Afr. Quart. Journ. 217.—Illust. Z. S. A. t. 32.

Inhabits S. Africa. Port Natal. Brit. Mus.

There are five specimens of different ages in the British Museum. This species resembles *C. Ogilbii* in size and colouring, but wants the dorsal streak. The females are horned.

The COQUETOON. *Cephalophus rufilatus*. TAB. IX.

Deep reddish bay; legs, nape, streak on the nose to the crown and broad streak on the back blackish grey; ears blackish; crest and upper part of tail black; cheeks rather paler; chin and abdomen pale yellowish; inside of ears whitish, with a brown spot on the outer side; horns conical, rather elongate, obscurely annulated, slightly recurved.

Cephalophus rufilatus, Gray, Ann. and Mag. Nat. Hist. 1846, 166.—*Antilope Grimmia*, H. Smith, G. A. K. v. 266.—*Le Grimme*, Buffon, H. N. xii. t. 41. f. 2, 3?

Var. 1. Sides paler, greyish red; forehead rough.

Le Grimme, F. Cuv. Mam. Lithog. t. . not good.

Inhabits Sierra Leone; Village of Waterloo. Called *Coquetoön*, and the pale variety called *Grimme* (Mr. Whitfield). Brit. Mus.

The hair is rather paler at the base, of the dorsal streak grey, with a blackish tip.

There is a male and female in the museum of the Earl of Derby, and a young female in the collection of the British Museum, presented by the Earl of Derby.

M. F. Cuvier's (Mam. Lithog. t. .) figure is the pale variety, which Mr. Whitfield regards as distinct; the separate head in this plate appears to have been taken from the Guevei.

**** *Knees not tufted; ears moderate, rounded; horns short, thick, conical; head with a pale streak on each side over the eyes to the base of the horns.*

The GUEVEI. *Cephalophus Maxwellii*.

Grey brown or sooty brown; sides of head and body greyer; chin, throat, chest and belly whitish grey; abdomen and front of thigh white; broad streak over each eye to the base of the horns yellowish white; feet and end of nose rather darker; fur rather rigid; hair uniform.

Antilope Maxwellii, H. Smith, G. A. K. iv. 267.—*A. pygmea*, Pallas, Spic. xii. 18?—*The Guevei*, Buffon, H. N. —*A. pygmea* (*Guevei*), F. Cuv. Mam. Lithog. t. . good.—*A. Frederici*, Laur.—Sundevall.—*A. Philantomba*, Ogilby, Proc. Zool. Soc. 1836, 121; 1839, 27.

Inhabits W. Africa. Brit. Mus.

This species is known from *C. monticola* by being larger, by the whiteness of the eye-streak, and of the front of the thigh and chest.

There is an adult male and female of this species in the British Museum; the male is bright sooty brown, darker near the rump; the female is nearly uniform pale grey brown. It is well-figured by M. F. Cuvier.

The NOUMETGE or CAPE GUEVEI. *Cephalophus monticola*.

Grey brown; streak over the eyes, legs and outer part of thighs rufous; feet grey brown; chin, chest, abdomen, and underside of tail and inside of ears white; fur soft, grey, with intermixed rather rigid black hairs.

Antilope monticola, Thunb. Stockh. N. H. xxxii. t. 5.—*A. cærulea*, H. Smith, G. A. K. v. 855.—Daniell's Afr. Scenery, t. .—Harris, W. A. A. t. 26.—*A. perpusilla*, H. Smith, G. A. K. v. 854.—*A. pygmea*, Licht. Saugth. t. 16.—Sundevall.

Inhabits South Africa. Brit. Mus.

The colours vary in intensity; in a female in the British Museum, the rufous colour of the thighs and the white of the chest are more distinct than in the male, but this may depend on the season when they were killed.

A very young fawn (perhaps hardly born), which was brought home from the Cape by M. Verreaux, is darker, and the reddish tint extends over nearly the whole body.

Thunberg described the South African species, but says that there is a specimen in the Stockholm Museum, brought by Afzelius from Sierra Leone, which agrees with his animal; so he evidently did not observe the difference between the two species.

The BLACK-RUMPED GUEVEI. *Cephalophus melanorheus*. TAB. X.

Grey brown; throat and sides paler; rump and upper part of tail black; chin, chest, abdomen, back and front edge of thighs and under part of tail white; narrow streak over the eyes whitish; feet like the back; fur soft, pale grey, with intermixed rather rigid black hairs.

Cephalophus melanorheus, Gray, Ann. and Mag. Nat. Hist. 1846.—*C. Philantomba*, Gray, Cat. Mam. B. M. 163. (not H. Smith.)

Inhabits Fernando Po (*J. Thompson, Esq.*). Brit. Mus.

There are two specimens of this species in the British Museum; they are easily known by the black mark on the rump; they are coloured like the Guevei from W. Africa, but smaller, and have the soft fur and interspersed black hair of the Cape Guevei, *C. monticola*.

The GRISLED GUEVEI. *Cephalophus punctulatus*. TAB. XI. fig. 1.

Dark fulvous brown; sides and legs rather paler; narrow streak over the eyes and inside of ears pale brown; chin, throat, chest, belly and front of thighs and under part of tail white; hair grey at the base, with brown ends and yellow subterminal rings; crown and upper part of tail darker; feet pale, varied.

Cephalophus punctulatus, Gray, Ann. and Mag. Nat. Hist. 1846.

Inhabits Sierra Leone. Brit. Mus.

We have a young specimen of this species in the British Museum, presented by Colonel Sabine, R.E.

It is at once known from the other *Gueveis* by the fulvous colour which is produced by the yellow sub-terminal rings of the hairs.

Colonel H. Smith indicates a species under the name of *C. Philantomba*, but so indistinctly, that it is impossible to know for what it is intended.

The WHITE-FOOTED GUEVEI. *Cephalophus Whitfieldii*. TAB. XI. fig. 2.

Yellowish ash; shoulders, outside of limbs and hinder parts of back rather darker; ears and crown pale yellowish brown; streak over the eyes, cheeks, throat, belly, inside of the limbs and ring round the feet above the hoof ashy white; hair ashy grey; of the back brown at the end, with a yellow tip.

Inhabits Gambia (*Mr. Whitfield*). Mus. Brit. Young.

Smaller than the *Grisled Guevei*, and much paler and yellower.

***** No tear-bag nor glandular streak on the face, and the muffle large and moist; crown smooth.

13. NANOTRAGUS (*Sundevall*), NEOTRAGUS (part *H. Smith*),

with very short, conical horns; slender legs; subpectinate tail; small, triangular hoofs, false hoofs none; crown not crested; ears small, rounded.

The ROYAL ANTELOPE. *Nanotragus regius*.

Fulvous; throat, belly and edge of thighs and tip of tail white.

Antilope regia, Erxleben, 278. — *Capra pygmea*, Linn. S. N. 101. 69. — Pallas? — Cuv. D. S. N. ii. 241. —
— H. Smith. — *C. perpusilla*, Linn. Mus. Ad. Fred. i. 12. — *A. spiniger*, Temm. — *Tragulus indicus*, and
T. guinensis, Brisson.

Inhabits W. Africa; Guinea. Brit. Mus.

The smallest-hoofed animal. The feet were formerly often used as tobacco-stoppers, and are figured mounted by Seba, t. 43. f. *a, b*; Buffon, H. N. xii. t. 42, 43.

14. ELEOTRAGUS (*Gray*), REDUNCA (*H. Smith*), CERVICAPRA (*Blainv., Sundev.*), NAGOR (*Laur.*), SYLVICAPRA (*Ogilby*),

with conical horns, bent back and then forward at the top; hoofs and false hoofs rather large; tear-bag none; teats four; inguinal pores distinct.

* The South-African species are grisled, and have the muffle large and extended behind the nostrils.

† Horns erect, slender, and face narrow; fur woolly hair.

The REHBOCK or PEELE. *Eleotragus Capreolus*.

Temple-spot none; head slender, compressed; horns erect, scarcely diverging, very slender; fur short, woolly, grey brown; back redder; throat and beneath white; end of nose and chin blackish; feet darker.

Antilope Capreolus, Thunb.—Afzelius, N. Act. Upsal. vii. 251. 1818.—Licht. S. t. 8.—Harris, W. A. A. t. 25.
f. 1.—*A. villosa*, Burchell, 1822.—H. Smith.—*A. lanata*, Desmoul.

Inhabits S. Africa. Brit. Mus.

The Earl of Derby has recently received one of these animals alive from the Cape, and it appears to be reconciled to its new locality.

†† Horns diverging, thick, conical; head broad; fur harsh, straight, with a subterminal pale band, and often whorled;
and a naked spot on the temple.

The INGHALLA or REIT BOCK. *Eleotragus arundinaceus*.

Head broad; temple-spot naked; horns diverging, conical, tapering. Brown, yellow grisled; hair pale brown, with a subterminal yellow band; cheeks and neck yellower; base of ears, chest, belly and insides of the legs and underside of bushy tail white; front of legs black.

Antilope arundinacea, Shaw, Zool.—*A. Eleotragus*, Schreb. Licht. t. 9.—H. Smith.—Harris, W. A. A. t. 26.
—*A. redunca*, H. Smith.—Gray, Cat. Brit. Mus.—*A. cinerea*, Afzelius, 1815.—*A. Lalandia*, Desmoul.—
A. Lalandiana, Desm.—*A. Lalandii*, Fischer.

Var. Larger.

A. Isabellina, Afzelius, N. Act. Upsal. 1815, vii. 244.—Licht. t. 10.—H. Smith.—Sundev.

Var. With a large black rhombic spot on the back of the head behind the ears. Brit. Mus. ♀.

Inhabits S. Africa, in marshy places. Brit. Mus.

Afzelius, Lichtenstein, H. Smith and Sundevall have described two species of this genus as coming from South Africa; the smaller they call *A. Eleotragus*, and the larger *A. Isabellina*. The latter author has given a comparative character between the two kinds, but he has only seen two specimens of the former (a male at Berlin and a female at Stockholm), and several specimens of the larger kind. I have examined with care a series consisting of four males and five females from different parts of South Africa, and can find no distinction between them, except a slight difference in the length of the fur and in its colour. We have two specimens which are larger than the rest, and have the tarsus one-fourth longer than the others; they have a shorter fur and are of a rather brighter colour, and the front of the leg is blacker; but the fur and colour probably depend on the season when they were killed. In these respects they agree with Sundevall's description of *A. Isabellina*, but they both have the temporal spot large and quite naked, while Prof. Sundevall described the spot on this species as pubescent. It is the female of the larger specimen that has the black spot on the back of the head; some of the smaller ones have the temple-spot much smaller and less naked than the others. The two larger specimens have a single whorl of hair in the middle of the back; the others, with longer hair, show the whorls more distinctly, and have the hair from the central whorls to the shoulders forming a more or less diverging line. After examining these specimens and those in other collections, I conclude that they form only a single species. M. Sundevall, in a note just received, observes: "Mr. Wahlberg considers *A. Isabellina* and *A. Eleotragus* as very distinct, and our specimens seem to show a difference, though not very well expressed. Also I have committed a mistake, for the young female described in my Synopsis as γ . under *A. Isabellina*, is really *A. Eleotragus*."

** *The species from West and East Africa have the muffle smaller, scarcely extending beyond the nostrils; fur fulvous, not grised; hair grey, with yellow tips; tail less bushy.*

The WONTO or NAGOR, or RED ANTELOPE. *Eleotragus reduncus*. TAB. XIII.

Head broad; horns conical, thick at the base, diverging; fulvous brown, rather pale on the sides; hair soft, yellow tipped, all in regular order; chin, throat, spot under ears and over eyes, inside of limbs, under side of tail and lower side of body white; front of leg sometimes blackish.

Antilope redunca, Pallas?—Ruppell, Abys. t. 7, good.—*A. rufa*, Afzelius, 250, from Buffon.—*A. reversa*, Pallas?—*Nagor*, Buffon, xii. t. 46?—*Oureby*, F. Cuv. Mam. Lithog. t. ♀.—*A. Isabellina*, Gray, Cat. Mam. Brit. Mus.

Inhabits "Senegal." Mus. Frankfort and Mus. Leyden. Gambia. Whitfield called it *Wonto*. Male and fawn, British Museum, and a young male living at Knowsley.

Var. Larger, colour brighter.

A. Bohor, Ruppell, Abys. t. 7.—Sundev.

Inhabits Abyssinia. Mus. Frankfort.

Pallas and Afzelius's account of this species is derived from Buffon's description; both he and Adanson (Hist. Nat. xii. 326) say that it is "all pale red," and Buffon further observes that it has not the white on the belly of the Gazelles. This does not agree with our animal, which is white in several parts, but certainly not so white as the Gazelle, and has black on the legs; but as yet no other animal has been brought from West Africa, which better agrees with their account or figure.

M. Sundevall considers the *Nagor* of Senegal and the *Bohor* of Abyssinia, which were in the Frankfort Museum, as distinct, the former having the hair of the back whorled, the fore leg with a dark stripe, and the latter having the hair not whorled and the legs pale. Our specimens, from Gambia, have the hair not whorled, and more or less distinct streaks on the fore-legs; hence I am inclined to believe the *Nagor* and the *Bohor* to be alike. Sundevall's animal may be the *Kob*, but that has only one whorl on each end of the back, a nearly cervine muffle, and the end of the tail black.

There is a male and a female of *Antilope Bohor*, from Abyssinia, in the Frankfort Museum. The male is rather larger than the male of "*A. redunca*," from Senegal, in the same collection, and much brighter, and the horns more slender; the females are darker and browner than the male; both have more black on the carpus and tarsus than in the specimen of *A. redunca* in the same museum.

Colonel Hamilton Smith formed a genus for two pairs of horns on part of the frontal bones in the College of Surgeons belonging to this group of Antelopes, which he called *Raphicerus acuticornis* and *R. subulata* (Griffith, A. K. t. 181. f. 2, 1). The figures are not sufficient to identify the species, and we now know that the horns of the same species differ greatly in individuals of the same species, and during the growth of the same specimen. *R. acuticornis* may be the horns of the *Duyker Boc*, *Ceph. Grimmia*?

The CERVINE ANTELOPES have an elongated tail, cylindrical at the base, and with long hair at the end, often forming a compressed ridge; the body heavy and the limbs strong. They are of a large size.

* Neck not maned.

15. ADENOTA,

with cordate, moderate, cervine muffle; nose hairy between the back of the nostrils; horns sublyrate, ringed, when young rather recurved; place of tear-bag covered with a tuft of hair; hair of the back whorled, of dorsal line and back of head reversed; tail elongate, hairy.

This genus is very like *Eleotragus*, but has a smaller, more cervine muzzle and lyrated horns; it differs from *Cobus* in the form of the tail, and wanting the mane, and from both in having a tuft of hair in the front of the orbit.

The ÆQUITOON. *Adenota Kob*. TAB. XIV. and XV.

Pale brown; end of nose, inside of ears, chest, belly, inside of legs and thighs, tip of tail, and band above hoofs white; front of fore and hind legs, and end of ears and tail black; hair of the dorsal line reversed, with a whorl on the shoulders and loins.

Antelope Kob, Erxl. from *Kob*, Buffon, N. H. xii. t. 32. f. 1? — Ogilby, Proc. Zool. Soc. 1836. — *Kobus Adansonii*, A. Smith, from Buffon. — *Gambian Antelope*, Penn. Syn. 39, from Buffon. — *A. adenota*, H. Smith, G. A. K. iv. 224. t. 184. and t. 183. f. 3, 4. horns? — *A. annulipes*, Gray, Ann. and Mag. Nat. Hist. 1843.

Var. Female, hair longer, sides of face whitish.

A. sing-sing, Gray, Cat. Mam. Brit. Mus. 159, not Bennett.

Inhabits W. Africa; Gambia. Called *Æquitoon* by the Joliffs, and *Kob* by the Mandingoes.

A fine pair has been at Knowsley some years. Thinking them new, I described them as *A. annulipes*. Mr. Ogilby has called it the *Nagor*, but it is scarcely the *Nagor* of Buffon. An adult male noticed by Mr. Ogilby as the *Kob* is now in the Museum of the Zoological Society; its horns, like the male at Knowsley, are much worn down.

They whistle like a stag.

Buffon (H. N. xii. 219, 267. t. 32. f. 1) figures a skull with horns, brought from Senegal by Adanson, under the name of *Kob*, which is also called the *Petit vache brune*. Erxleben gave this figure the name of *A. kob*, and Pennant called it the *Gambian Antelope*, Syn. i. 39. The figures somewhat resemble the head of a half-grown male of this species, but the horns are longer, and have more rings than our specimen in the British Museum; but I am inclined to agree with Mr. Ogilby in believing that it was intended for this species. In the Jardin des Plantes they called the Sing-Sing the *Kob* of Senegal. This may be a mistake for the *Koba*. I may remark that the horns of the *Koba* in the same plate of Buffon are represented with more rings than are mentioned in the description.

Colonel Hamilton Smith describes and figures a male and female specimen which were alive in Exeter Change, and figures the male and its skull and horns under the name of *A. adenota*, which well agrees with this species, and has the peculiar distribution of its hair; hence its name: but he says, it has "a long open suborbital slit, and small black brushes on the knees;" but I suspect that must be a mistake, as he himself observes no lachrymal cavity was found in the skull. He might have mistaken the tuft of hair for the gland at the distance at which he saw the specimens. He also (G. A. K. iv. 221) described a specimen which was in Exeter Change, which he regarded as the *Gambian Antelope* of Pennant, and calls *A. forfex*. His characters agree in most particulars with this species, but he says it had "a long lachrymal sinus, and had small brushes on the knees." If there was not some mistake in transcribing these descriptions, both these animals should be *Gazellas*, but I have never seen any which agreed with them.

The young male in the British Museum shows the development of the horns of these animals. The upper rings of the growing horn fall off in large thick flakes as the horn increases in size beneath: this explains how the extent of the smooth tapering part of the horns increases in length as the horn grows, and how the number of rings are found to be nearly the same in the various ages, and different individuals of the various species. Mr. Whitfield also informs me that the scrotum is rarely developed or dependent externally in different kinds of Antelopes before they have completed their first year.

The Earl of Derby, in answer to some queries, observes : “ As to the *Nagor* of Ogilby, it has no tuft on the knees, nor has it the mark you have traced on the paper given to John Thompson. The inside of the fore limbs is pure white, and the hair so long as to give a sort of fringe to the edge of the bone. I could not perceive any mark between the nostrils, as you have marked on your paper, but the whole space between them and around appeared to me naked and black ; but I may not be quite accurate, as he was much excited, and several men had some difficulty in holding him. The *Nagor* has on the outside front of the fore-arm a stripe of black for some inches above the knee, and also a good deal of the same colour upwards from the fetlock, from two inches below the hough down to the foot. It has also some of the same colour on the hind legs, in front, but I did not notice particularly how much ; but behind, it has only the ring above the fetlock ; whence I imagine you gave it the name of *A. annulipes*.”

** Neck maned on the sides.

16. KOBUS (*H. Smith*), CERVICAPRA (part *Sundev.*), ÆGOCERUS (*Harris*), KOLUS (*Gesner, Gray*), with elongate, sublyrate horns, bent back and then forward at the top ; muzzle cervine ; tear-bag none ; inguinal pores none ; hair rough, elongate ; neck covered with longer, diverging and drooping hair ; tail rather elongated, depressed, hairy on the sides and below : females hornless ; teats four ; animal very large.

The PHOTOMOK OR WATERBUCK. *Kobus Ellipsiprymnus*.

Rump with a whitish elliptical ring near the base of the tail, brownish ; horns converging at the tip.

Antelope Ellipsiprymna, Ogilby, P. Z. S. 1833, 47.—*Harris*, W. A. Africa, t. 14.—*Kobus Ellipsiprymnos*, A. Smith, Illus. Z. S. A. t. 28, 29.

Inhabits S. Africa Brit. Mus.

The horns figured as *A. Kemas*? (*H. Smith*, t. 181. f. 6) appear to belong to this species.

The SING-SING. *Kobus Sing-Sing*.

Anal ring none. Reddish or yellowish grey brown, rather greyer on the shoulders ; nose, lips and hinder part of the thighs, under the neck, from the ears to the gullet, a streak over each eye, and ring above the hoofs and false hoofs white ; belly and legs blacker ; end of tail, and legs from shoulder to hough black. Female greyer ; belly and upper part of legs paler.

Antelope Sing-Sing, Bennett.—*A. defassa*, Ruppell, Abys. t. 3.—*A. unctiosa*, Laur., D’Orbig. Dict. Univ. H. N. i. t. 622. ♂ good.—*A. Koba*, Ogilby, Penny Cyclop. ii. 79. fig. ♀ ; P. Z. S. 1836, not Erxleben.—*Koba*, Buffon, H. N. xii. 210. 267. t. 32. f. 2. horns?—*Senegal Antelope*, Pennant, Syn. 38. (part from Buffon only.)

Inhabits N. and W. Africa ; Gambia (*Whitfield*). Brit. Mus. Senegal. Called *Kassimause* and *Kob*. Abyssinia (*Ruppell*). Mus. Frankfort.

This species varies much in the tint of the colouring, and in the length of the hair in the different seasons. In summer they are covered with very short, closely pressed fur, letting the skin be seen between the hairs. In the cold weather, and in England, the fur is longer and more abundant. The hair of the chin and neck is long and rigid in all seasons, and even in the young animals. The tail of the adult specimen is cylindrical and nearly bald, ending in a tuft of black hair ; in the young specimens, especially in the winter fur, the base of the tail is fringed with hair on each side. The male is much brighter coloured, and the chest and belly are nearly black like the legs. The hinder parts of the rump of the young animals are greyish white ; in the older specimens it becomes pure white and broader in extent.

This animal is called *Sing-Sing* by all the negroes. They do not think their flocks of cattle will be healthy or fruitful unless they have one of the Sing-Sings accompanying them, as some persons think a Goat necessary to be in a stable in England. The English on the Gambia call it the *Jackass Deer* from its appearance, and it is called *Koba* and *Kassimause* by the negroes at Macarthy’s Island. Its flesh is very strong, unpleasant and scarcely palatable.

As far as I could judge by my recollection and description, the adult specimen at Knowsley, the young male and adult female in the British Museum, the male and female at Frankfort, and the adult male in the Paris menageries are the same species.

Buffon figured (Hist. Nat. 210, 267. xii. t. 32. f. 2) under the name of *Koba* a pair of horns which were in the Library of St. Victor at Paris. He described them as larger and more curved above than those of the *Kob*, eighteen inches long and five inches in circumference at the base, and he refers them to an animal which Adanson says is called *Koba* in Senegal, and the *Great Brown Cow* by the French colonists. Pallas refers these horns to *A. Pygargus*, and the figures and description agree in many particulars with the

horns of that species; but they are rather longer, and have more rings. Pennant (Syn. Mam. 38) has given the name of *Senegal Antelope* to Buffon's short account and figure, but has added to it the description and the figure of the head of a skin which came from Amsterdam, and appears to be *A. Caama* of South Africa. Cuvier (Dict. Sci. Nat. ii. 235) has translated Pennant's name to *A. Senegalensis*. Erxleben (Syn. 293) and Zimmerman (Zool. 345) have translated Pennant's description of his skin of *A. Caama*, and called it *A. Koba*, referring to Buffon's description and Daubenton's figure. Fischer, Hamilton Smith and M. Sundevall regard the *Koba* of Buffon the same as the *Korrigum* of Denham and Clapperton, but the horns of that species are considerably longer and much thicker at the base than those described by Daubenton, and the annulations of the horns are higher and more regular: but it may be remarked that Buffon describes his horns as having eleven or twelve rings, but figures them as having seventeen or eighteen. Mr. Ogilby (Penny Cyclopædia and the Proceedings of the Zoological Society) considers Buffon's *Koba* to be the *Sing-Sing*; and in the length of the horns, and in the number, disposition and form of the rings it more nearly agrees with the horns of that species than of that of the *A. Pygarga*, to which Pallas first referred it; but it is much more lyrated than any horns of the *Sing-Sing* I have seen; indeed, not one of the specimens which have come under my observation have had any inclination to assume that form: but as this is the only Western-African species which in any way agrees with Buffon's figure, perhaps it is best to adopt Mr. Ogilby's suggestion. The name of *Koba* or *Kob* appears to be common to many species. Schinz erroneously considers *Damalis Senegalensis*, *Antilope adenota* and *A. forfex* (H. Smith) as synonyms of this species.

*** Nape with a recurved mane.

17. AIGOCERUS (*H. Smith*), EGOCERUS (*Desm.*), HIPPOTRAGUS (*Sundev.*),

with conical, elongate, rather compressed, ringed, recurved horns; neck with a linear reversed mane above; tear-gland covered with a tuft of hair; teats two.

ETAAK OR EQUINE ANTELOPE. *Aigocerus Equinus*.

Spot above the eyes and pencil before the eyes fulvous grey; nose whitish; face black; nuchal mane distinct.

Aigoceros Equina, H. Smith.—Harris, W. A. A. t. 21.—*A. glauca*, Forster.—*A. Osanne*, Geoff.—*A. barbata*, H. Smith.—*A. Truteri*, Fischer.—*A. aurita*, Burch, MSS.—*Capra Æthiopica*, Schinz.—*Tzeiran*, Buffon, H. N. xii. t. 31. f. 6. horn.

Inhabits S. Africa. Males. Brit. Mus. W. Africa; Gambia (*Whitfield*). Horns. Brit. Mus.

The head of the female covered with the skin from Macarthy's Island, on the coast of Gambia, which Mr. Whitfield brought home, did not appear to differ from the specimen from the Cape which we have in the Museum. The species does not appear to be uncommon in the locality, for Mr. Whitfield brought over several other pairs of horns. He informs me the flesh is very good venison. "It is called *Docoi* or *White Mouth* by the Mandingoes, *Kob* and *Koba* by the Joliffs, and *Vache brune* by the French at Senegal." This is certainly not the *Kob* of Buffon (xii. t. 32. f. 1, 2). The negroes at the Gambia declare that this animal never bears more than one fawn; for after that period, the horns increase in length, and enter the loins and destroy the animals!

Buffon (xii. 271. t. 31. f. 6) figures the horn of this species, which had been made into a powder-flask, under the name of *Tzeiran*.

A. barbata (Daniels) appears to be only a bad drawing of this species.

The BLAUBOC. *Aigocerus leucophæus*.

"Fur glaucous grey; tuft before the eye short, brown; nuchal crest none; hoofs small."

Antilope leucophæus, Pallas.—H. Smith, G. A. K. v. t. 179.—Sundevall.

Inhabits the Cape of Good Hope; now extinct. Mus. Stockholm, Mus. Upsal and Mus. Paris.

The size of the Common Stag, *Cervus Elaphus*. M. Sundevall observes that it is as different from *A. Equina*, as the species of *Eleotragi* and *Tragelaphi* are from one another; and he observes, in a letter I have just received, "I must tell you, that after the inspection of a whole series of *A. Equina*, which Wahlberg brought home, I am convinced that the *A. leucophæa* of Pallas is a very distinct race. Our stuffed specimen, that must have been adult, has much smaller hoofs than the very young *A. Equina*, male as well as female, amongst Wahlberg's, and in the tuft over the lachrymal sinus, as I have shortly expressed in the printed survey."

When I examined the specimen at Paris I regarded it as a young or rather dwarf specimen of *A. Equina*, and the absence of the nuchal crest led to this belief; and I am not satisfied that the number of rings on the horns are a sufficient proof of its being adult.

The BLACK BOB. *Aigoceros niger*.

Black; female and young brown; face white, with a dark streak.

Antilope niger and *A. Harrisii*, Harris, Wild African Anim. t. 23.

Inhabits S. Africa. Brit. Mus. Males and female and young.

18. ORYX (*Blainv.*, *H. Smith*),

with elongate, subulate horns, ringed at the base, straight, or slightly arched, placed in a line with the face; neck maned above and below; tear-bag none; nose subcervine, with a marginal muffle; hoofs narrowed in front, false hoofs large; teats four (two, *Harris*). In the skull there is a slight sub-orbital fissure, but no pit, and the grinders have supplementary lobes.

The KOOKAAM OR GEMSBOK. *Oryx Gazella*.

Horns straight, shelving backwards; throat with a bunch of black hairs; black streak on the face, conjoined under the chin; rump, face, spinal line, lateral streak, and very broad band on the thigh and cubitus black in summer. Young pale brown; hairs blackish at the base.

Capra Gazella, Linn.—*Antilope Oryx*, Pallas.—*H. Smith*.—*A. bezoartica*, Pallas.—*A. recticornis*, Erxl.—Pallas, Nov. Comm. Petrop. xiii. t. 10. f. 6.—*Oryx Capensis*, Ogilby.—Harris, W. A. A. t. 9.

Inhabits S. Africa; Cape of Good Hope. Brit. Mus. Adult and young.

The BËISA. *Oryx Beisa*.

Horns straight; throat without any bunch of hairs; black face-streaks separate.

"Pale; face, belly and limbs white; front of face, two streaks on cheek, narrow line along throat, dorsal streak, streak on each side abdomen, band round upper part, and streak in front of lower part of fore-leg and end of tail black."

Antilope Beisa, Ruppell, Atlas, t. 5.—*Oryx Beisa*, Sundevall.

Inhabits Abyssinia. Mus. Frankfort.

There is a male and female in the Frankfort Museum; they are smaller than *A. Gazella* of the Cape, and both have the face-streaks separate: there is a black streak on the throat, as in *A. Gazella*, but no bunch, nor is there any in the Frankfort specimen of *A. Gazella*: the mane of the nape of the male is small, indistinct, continued behind in a broader dark streak to the middle of the loins. In the male the mane is blackish, in the female like the back. They have no dark mark on the rump, found in *A. Gazella*.

The ORYX. *Oryx leucoryx* (*H. Smith*).

Horns slender, slightly arched: white, reddish varied; in winter greyish.

Antilope leucoryx, Pallas.—Ehrenb. S. P. t. 3.—Licht. Saugth. t. 1.—*A. ensicornis*, Ehrenb.—*A. Algazella*, Rupp. t. —*A. Gazella*, Pallas.—*A. bezoartica*, Erxl.—*H. Smith*.—*Algazelle*, F. Cuv. Mam. Lith. t. —*A. Eleotragus*, Schreb. t. . (not descrip.)

Inhabits N. and W. Africa; Nubia; Sennaar; Senegal.

I have compared the Nubian and Senegal specimens, and cannot discover any difference between them.

There is a fine adult male at Knowsley; white; neck, crest, ring round the top of the fore- and hinder-legs, and a slight line on the lower part of the sides brown; streak across the eyes, lozenge-shaped spot between the base of the horns, and a large, elongated spot on the centre of the nose dark grey; tail flattened at the base, and ending in a tuft of very long, rather curled hair.

It is very vicious, and has worn away the front of the horns in some parts, even so as to expose the core, by rubbing it against the wall of its stable, and especially against the chain with which it is fastened.

**** Throat slightly maned. .

19. ADDAX, ORYX (part *Blainv.* and others), GAZELLA (part *H. Smith*),

with slender, elongate, ringed, slightly spirally twisted horns, nearly on a line with the face; neck with a slight gular, but no nuchal mane; nose ovine, hairy; hoofs semicircular, edged; tear-bag marked by a tuft of hair; forehead longly hairy.

The ADDAX. *Addax nasomaculatus*.

White; forehead and front of face darker; grey in winter.

Antilope nasomaculatus, Blainv.—*H. Smith*.—*A. Addax*, Licht. Saugth. t. 2.—Rupp. Atlas, t. 7.—Mam. Lith. t. —*A. suturosa*, Otto, N. A. Nat. Cur. xii. t. 48.—Griffith, A. K. t. 180.—*A. gibbosa*, Savi.—*A. Tao*,

H. Smith.—*A. Mytilopes*, H. Smith, G. A. K. t. 182, 183. f. 6.—*Strepsiceros*, Cajus.—*Addax*, F. Cuvier, Mam. Lith. t. . (winter and summer.)—Ehrenberg, S. Phys. t. 4, male and female.—*Capra Cervicapra*, Linn. S. N. ed. 10.—*Ant. Cervicapra*, Children, Denham Trav.

Inhabits N. Africa. Brit. Mus. Knowsley.

There is now an adult male at Knowsley, and his son. The latter is dark grey, with the cross on his face, the lips, rump and legs white; the horns are very thick and solid. His sire has much more slender and longer horns, and the rump is only pale grey, gradually passing into the colour of the back; not a distinct white mark, as in the younger specimen.—December 1846.

The GOAT-LIKE ANTELOPES have a very short flat tail, hairy above. They have heavy bodies, covered with rough, rigid or woolly fur, strong legs, large hoofs and false hoofs. The horns are conical and recurved.

* *Nose cervine, with a moderate muffle and short, inclined, recurved horns.*

20. CAPRICORNIS (*Ogilby*), NEMORHEDUS (part *H. Smith*),

with short, strong, conical, ringed, inclined and recurved horns arising behind the orbits; nose cervine, muffle moderate, bald; tear-bag and interdigital pores large; skull with a more or less deep rounded pit, and no suborbital fissure; grinders without supplemental lobes. Asia.

The CAMBING OUTAN. *Capricornis Sumatrensis*.

Black; chin and linear nuchal mane yellowish, especially near the withers; inside of the ears white. Young like the adult.

Antelope Sumatrensis, Shaw.—H. Smith, G. A. K. t. 189 (cop. from).—F. Cuv. Mam. Lith. t. .—*A. interscapularis*, Licht.

Inhabits Sumatra. Mus. Leyden.

The THAAR OR THAR. *Capricornis Bubalina*.

Grey brown, blackish washed; crown and dorsal line black; thighs and outside of legs rufous; nose, chin, inside of ear, lower part of mane and legs below the hocks whitish.

Antelope Bubalina, Hodgson, P. Z. S. 1832, 12.—*A. Thar*, Hodgson.—*Nemorhedus proclivis*, Hodgson.

Inhabits India; Nepal.

A head was sent to the United Service Museum by Lieut.-Colonel Childers, of the 11th Dragoons, in 1820, under the name of *Serow* or *Imo*.

“It is not speedy, as might be inferred from its make. Its flesh is very coarse and bad. It is usually killed with poisoned arrows.”—*Hodgson*, l. c. 14.

The JAPANESE GOAT ANTELOPE. *Capricornis crista*.

Fur harsh, crisp; brown or brownish; sides whitish; cheeks white; legs black brown.

Antelope crista, Temm. Faun. Japan. t. 18, 19.

Inhabits Japan. Mus. Leyden.

** *Nose ovine, hairy, without any muffle; horns short, conical, recurved, ringed.*

21. NEMORHEDUS (part *H. Smith*), KEMAS (*Hodgson*),

with short, conical, inclined and recurved horns arising from behind the orbits; nose ovine, hairy; muffle none; tear-bag none; interdigital pores large; fur short.

The GORAL. *Nemorhedus Goral* (*H. Smith*).

Grey brown, black punctulated; streak on lower part of back of neck blackish; cheeks, chin and upper part of throat white; front of fore-legs blackish; feet rufous. Young paler; dorsal line rather darker.

Antelope Goral, Hardw. Linn. Trans. xiv. t. 14; Calcutta J. N. H. i. t. 12. f. 2, 3.—*A. Goral*, Hodgson.—*Bouquetin du Nepaul*, F. Cuv. Mam. Lith. t. . (copy from Hardw.)—*A. Duvaucellii*, H. Smith.

Inhabits Nepal.

A. Duvaucellii (*H. Smith*) was described from a drawing traced from one of General Hardwicke's figures and badly coloured, which Duvaucel sent to Paris without any notes. In the Bengal Journal two Antelopes, said to resemble the *Goral*, are mentioned as found in Affghanistan, one called *Suja* and the other *Goomast*.

22. MAZAMA (*Rafinesque*), APLOCERUS (*H. Smith*),

with small, conical horns, nearly erect, slightly inclined and recurved at the tip, ringed at the base; nose ovine, hairy; muffle none; tear-bag none: fur short, under fur woolly, outer very long, hairy and dependent.

The MAZAMA OR SPRINGBUCK. *Mazama Americana*.

White; horns, hoof and edge of nostrils black.

Rupicapra Americana, Blainv.—*Antilope Americana*, Desm.—*Capra Americana*, Rich. F. B. A. 268. t. 22.—*Ovis montana*, Ord.—*Capra montana*, Harlan.—*A. lanigera*, H. Smith.—*Mazama dorsata* and *M. sericea*, Rafin.—*A. Mazama* and *Apl. Femmamazama*, H. Smith.—*Capra? Columbiana*, Desmoul.—*Rock Mountain Sheep*, Jameson, Mem. Wern. Soc. iii. 306.

Inhabits N. America; Rocky Mountains. Spec. Mus. Linn. Soc. and Zool. Soc.

23. RUPICAPRA,

with elongate, slender, erect horns, recurved at the tip; nose ovine, hairy; muffle none; fur soft; skull without any pit, and with a minute suborbital fissure; grinders without supplemental lobes, cutting-teeth equal-sized, erect.

The CHAMOISE OR GERUS. *Rupicapra Tragus*.

Brown yellowish, with a dark dorsal streak in summer, blackish in winter.

Capra Rupicapra, Linn.—*A. Rupicapra*, Pallas.—H. Smith, G. A. K. t. 90.—*Rupicapra Capella*, Bonap.—*R. pyrenaica*, Bonap.—*Tragus Dorcas*, Klein.—*Chamoise*, Buffon, H. N. xii. t. 16.—F. Cuv. Mam. Lith. t.

Inhabits S. Europe; Switzerland and Pyrenees. Brit. Mus. and living at Knowsley, 1846.

24. ANTILOCAPRA (*Ord*), DICRANOCERUS (*H. Smith*), OREAMMOS (*Rafin.*), CERVUS (*Blainv.*),

with erect horns, the base compressed with a flattened process in front, the end conical, recurved; nose ovine, hairy; muffle none; fur very close; hair stiff, coarse, flattened, wavy; tail very short; false hoofs none; tear-bag none; inguinal pores none; legs rather slenderer than the other *Goat Antelopes*; skull without any suborbital depression, but with a lengthened fissure; grinders without supplemental lobes, cutting-teeth equal-sized and shelving.

The CABRIT OR PRONGHORN. *Antilocapra Americana* (Ord, 1818).

Pale fulvous; upper part of rump white.

Antilope Americana, Ord, 1815.—*A. furcifer*, *A. palmata*, H. Smith, Linn. Trans. xiv. t. 2, 3; G. A. K. t. 178. t. 199. f. 1—5.—Richards. T. B. A. t. 21.—*Cervus hamatus*, Blainv.—*C. bifurcatus*, Rafin.

Inhabits N. America; in the plains in summer and in the mountains in winter. Called the *Goat*. Mexico (*Coulter*).

Dr. Coulter brought a head from Mexico which had the face dark brown, and the horns large, wide-spreading and much hooked at the tip, like the *A. palmata* of H. Smith (Proc. Zool. Soc. 1826, 121). This is probably only a larger variety in the summer fur.

The ANTELOPES OF THE DESERT. Nostrils bearded within beneath, operculated, far apart; horns on the frontal ridge; nose subcervine, with a small muffle; legs rather stout; tail elongate; hoofs rather large.

In the EQUINE ANTELOPES the muzzle is very depressed, spongy and bristly.

25. CATOBLEPAS (*Gray*), CONNOCHÆTES (*Licht.*), BOS (*Forster*),

with horns bent down on the sides, recurved at the tip; nose very broad, dilated, spongy, bristly; nostrils operculated; tail elongate, bushy, hairy from the base; hoofs compressed in front; teats four.

This genus has been placed with the Oxen by Forster, and in the Bovine group of genera by Sundevall, but it has all the characters of the true Antelopes in the proportion of its leg-bone.

* Nose with a crest of reversed hair; chest maned. Catoblepas.

The GNU OR KOKOON. *Catoblepas Gnu*.

Nose with a tuft of reversed hair; chest maned. Brown or blackish; the lower part of the mane and tail often paler or white. Young: pale fulvous; nasal gular and nuchal mane black.

Antelope Gnu, Sparm.—Zimmerm.—*Bos Connochætes*, Forster.—*Antelope taurina*, Burchell.—*C. Gnu*, H. Smith.
—*C. taurina*, H. Smith, not A. Smith.—*Gnu*, F. Cuvier, Mam. Lith. t. —Harris, W. A. A. t. 1.

Var. Mane and tail black.

A. taurina, Burchell.—A. Smith.

Inhabits S. Africa.

The *A. Gnu* of Burchell, H. Smith, F. Cuvier and Harris, “and the *Kokong* of Lichtenstein,” has a white tail and mane. Burchell and H. Smith have given the name of *A. taurina* to their specimens, which have those parts black. When young they are fulvous, and become black as they reach maturity. The specimen of the *Kokoon* in the Museum of the London Missionary Society (Blomfield Street, Moorfields), named by Colonel H. Smith *Kokoon* (*Cat. taurina*, Griff. A. K. iv. 369. v. 368), is an adult common *Gnu*, *C. Gnu* (*Var.* mane and tail white; *Kokong*, Licht. Trav. Cape), and his description of Dr. Burchell’s specimen in the British Museum agrees with the *Gnu*, in having the ridge of hair on the face. Indeed Dr. Burchell (Travels, ii. 278) appears to rest the difference between the *Gnu* and *A. taurina*, in the former having a white and the latter a black tail. Dr. Andrew Smith (Illust. Zool. S. A.) has regarded the *C. taurina* and *C. Gorgon* as the same species. Dr. Sundevall, in his Synopsis, has, by mistake, given the name of *C. taurina* to the *Gorgon*, or *Brindled Gnu* (*C. Gorgon*, H. Smith).

** Nose with smooth hair; chest not maned. Gorgon.

The GORGON. *Catoblepas Gorgon* (H. Smith).

Face convex, smooth, covered with hair, lying towards the nose; chest not maned; black grey, varied and striped. Young: dark grey; face, gular and nuchal mane and end of tail black. Half-grown: blackish; crown grey.

Antelope Gorgon, H. Smith.—Harris, W. A. A. t. 4.—*Cat. taurina*, Sundev., not Burch. or Smith.

Inhabits S. Africa.

Colonel H. Smith has figured a pair of horns which were in Mr. Brookes’s Museum under the name of *C. Brookesii* (t. 201. f. 1). He thinks it is also probable that *Bos Pegaseus* (H. Smith, G. A. K. t. 204, from a drawing of Prince Maurice’s) is a species of this genus (H. Smith, Jard. Nat. Lib.).

In the BOVINE ANTELOPES the nose is moderately broad, with a moderate or small, bald, moist muffle; the grinders are rather small, without supplemental lobes, the central cutting-teeth enlarged at the end.

26. BOSELAPHUS, BUBALIS (*Licht., Ogilby*), ACRONOTUS (*H. Smith*), BUBALUS (*A. Smith*),
ALCELAPHUS (*Blainv.*), BUSELAPHUS (*Ray*),

with lyrate horns, end suddenly curved at a nearly right angle, thick at base, on the upper edge of the frontal bones; nose moderately broad, cervine; muffle moderate, bald, moist; tear-bag covered with a tuft of hair. Females: teats two.

The BUBALE. *Boselaphus Bubalis*.

Pale brown in early uniform; rump like back.

Antelope Bubalis, Pallas.—*Capra Dorcas*, Houttayne, t. 24. f. 3.—*Buselaphus Caji*, Ray.—*Bubalis Mauretanica*, Ogilby.—Sundevall.—*Acronotus Bubalis*, H. Smith.—*Bubale*, F. Cuv. Mam. Lith. t. —*Cervine Antelope*, Penn.

Inhabits N. Africa; Tunis. Calf. Brit. Mus.

Mr. Frazer brought from Tunis a skin, without a head and hoofs, which appears to belong to this genus: it was uniform pale brown; but there was a dark brown streak down the outer side of the front of the fore-legs, like the streak on the leg of the *Lecama* or *Harte beast* from South Africa, which is not generally found in this species. This skin probably indicates a third species, or perhaps this streak is only marked in the very adult or fully-coloured specimens.

The LECAMA OR HARTE BEEST. *Boselaphus Caama*.

Grey brown; dorsal line, streak on face, outer side of limbs black; large triangular spot on the haunches whitish.

Antelope Caama, Cuv. D. S. N. ii. 242 (1816).—Harris, W. A. A. t. 7.—A. Smith, Illust. Z. S. A. t. 31.—*A. Bubalis*, Licht.—Erxleb. 291.—*Acronotus Caama*, H. Smith, G. A. K. t. 197.—*A. Dorcas*, Thunb.—Sparm. K. V. Hand. 1779, t. 5.—*Bubale*, Buffon, H. N. xii. t. 38. f. 2; Supp. iv. t. 15.—*Caama*, Cuvier,

Menag. t. —*Senegal Antelope*, Penn. Syn. 38.—*A. Senegalensis*, Cuvier, Dict. Sci. Nat., from Pennant.—*A. Koba*, Erxleb. Syn. 293, from Pennant.

Inhabits S. Africa. Brit. Mus.

Pennant figures the head and horns of this species under the *Senegal Antelope*, and erroneously refers to Buffon's figures of the horns of the *Koba* as representing the species, which lead to some confusion; for the *A. Senegalensis* (Cuvier, Dict. Sci. Nat. ii. 235) is an abbreviation, and *A. Koba* (Erxleben, Syn. 293) is a translation, of Pennant's description of this species. Pennant's specimen is said to come from Senegal, but he describes the nuchal line and the knees as black, and the figure indicates the dark colour on the face of the Cape species.

27. DAMALIS, DAMALIS ACRONOTUS, sp. (*H. Smith*), BUBALIS, sp. (*Sundev.*)

with lyrate, diverging, subcylindrical horns; a moderately broad, cervine nose; with a small, bald, moist muffle between and below the nostrils; an exposed tear-bag. The females have two teats.

* *Horns recurved above, diverging from the base; face dark in front.*

The SASSAYBY. *Damalis lunatus*.

Rufous glaucous, outer sides of the limbs dark.

Antelope lunata, Burchell, Trav. ii. 334, 335. fig. —*Damalis (acronotus) lunatus*, H. Smith, G. A. K. t. 198.—*A. Smith*, Zool. S. Afr. t. 31.—*Harris*, W. A. A. t. 8.—*Bubalis lunata*, Sundev.—*Sassaybi*, Daniel, Afr. Scenery, t.

Inhabits S. Africa.

** *Horns regularly lyrate, nearly parallel at the base, then diverging, and approaching at the tips; face black marked; tear-bag moderate.*

The KORRIGUM. *Damalis Senegalensis*. TAB. XXI.

Reddish grey; front of face from nose to occiput, a small spot behind the eyes, a small streak above the angle of the mouth, and streak on outside of the limbs above the knees, and tuft of the tail, black. Very young: uniform pale brown, without any dark marks.

Antelope and Damalis (acronotus) Senegalensis, H. Smith, G. A. K. v. t. 199. f. 3.—*Antelope Koba*, Children, in Denham and Clapperton's Travels, not Erxleben.—*Bubalis Koba*, Sundevall.—*B. lunata*, Sundev. Act. Stockh. 1842, 201, 243, not Burchell.—*A. Corrigum*, Ogilby.

Inhabits W. Africa; Gambia River, Macarthy's Island; called *Yonga*, Mr. Whitfield. Senegal? Senaar. Mus. Stockholm.

Mr. Whitfield informs me the species is found on Macarthy's Island, on the Gambia. They afford very good venison. They are called *Yonga* or *Yongah* by the Ioloffs, and *Tan Rong* by the Mandingoes.

In Denham and Clapperton's Travels I regarded this species as the *Koba* of Buffon, and H. Smith and Dr. Sundevall are of the same opinion: but on comparing the six pairs of horns of this species which I have been able to examine with Buffon's figure and descriptions, I find them all longer and much thicker at the base than Buffon describes them; the thinner (a female?) being 7 and the others 9 or 9½ inches in circumference, while that Buffon described is only 5 inches. The rings are also more elevated, and reach nearer to the top than in Buffon's figure. All the characters lead me to believe that the horns figured as those of the *Koba* by Buffon belong to *Damalis Pygarga*.

Colonel Hamilton Smith, in 'Griffith's Animal Kingdom,' described and figured the heads brought home by Messrs. Denham and Clapperton as *A. Senegalensis*, but they are different from the one so called by Cuvier. Mr. Ogilby, in the 'Proceedings of the Zoological Society' (1826, 103), proposed to call these heads, *A. Corrigum*.

Under the name of *Antelope Koba*, Schinz (Syn. Mam. ii. 407) combines the *A. defassa*, Ruppell, *Damalis Senegalensis* and *Antelope adenota*, H. Smith, the *Koba* of Buffon, and the *Antelope Koba* or *Caama* of Erxleben.

*** *Horns regularly lyrate, parallel at the base; face of adult white.*

The BONTE BOU. *Damalis Pygarga*. TAB. XX. fig. 3. young; TAB. XXII. fig. 2 & 3.

Purple red, outside of limb dark; rump and face white: fawn pale yellowish brown.

Antelope Pygarga, Pallas.—*Bonte Bou* or *Pied Antelope*, *Gazella Pygarga*, Harris, W. A. A. t. 17.—*Bubalis Pygarga*, Sundev.—*A. Dorcas*, Pallas.—*Antelope (Gazella) Pygarga*, H. Smith.

Half-grown, face whitish.

A. personata, Wood, Zool. Journ. ii. t.

Inhabits S. Africa.

The Earl of Derby received a pair from the Cape. They were bright purple red, face whitish, dark-edged, with a dark-edged white streak to between the horns; legs whitish, upper and lower part brown varied; temple and upper part of the throat whitish; rump to above the tail pure white; tear-bag round, distinct, moist. The female is similar, but the throat and under part of the body are white. These animals are often brought to the Cape market for food.

The BLESS BOCK. *Damalis albifrons*. TAB. XXII. fig. 1.

Purplish red; face and back of thighs white; rump like back.

Bless bok or *Antelope albifrons*, Burchell, Trav. ii. 335?—Harris, W. A. A. t. 21.—*Bubalis albifrons*, Sundev.

Inhabits S. Africa.

With the pair above described there was a half-grown specimen of the *Bless bock*, of the same size. It was darker, with a pale spot between the horns, separated by a dark spot from the white on the face; the temple was white, with a white spot; the legs had a brown stripe down the outer side of the front; and the throat and rump brown, the latter without any white spot.

Dr. Burchell, when speaking of the *Bless bock*, proposed to call it *A. albifrons*, as the name *Pygarga* has been used for both the *Springer* and the *Bless bock*; but it is not certain if he intended by *Bless bock* this or the preceding species. Captain Harris's figure shows the distinction of the species.

**** —?

The DORIA. *Damalis?* *Zebra*.

Bright golden brown, with numerous black cross bands narrowing at the sides; outer sides of fore and hind legs dark

Antelope Zebra, Gray, Ann. Nat. Hist. 1836.—*A. Doria*, Ogilby, P. Z. S. 1836, 121.—Frazer, Z. T. t. .—*A. Zebrata*, Robert.—*Viverra Zebra*, Whitfield's MSS.—*Cephalophus? zebra*, Gray, Cat. Mam. B. M.

Inhabits W. Africa; Gambia.

Skins without head and feet are alone known; they are brought down by the negroes. In the Catalogue of the Mammalia in the British Museum I have referred this species with doubt to *Cephalophus*. Mr. Ogilby (P. Z. S. 1836, 121) thinks it should be referred with the Harness Antelopes to *Calliope*. I am inclined, on account of the dark mark on the outside of the limb, to think it belongs to the genus *Damalis*. Mr. Whitfield believes it to be a species of *Viverra*.

Since the preceding pages were printed in 1847, there have been discovered the following species:

[Between GAZELLA and ANTILOPE, insert—]

3 A. PROCAPRA (*Hodgson*),

with strong, elongated, lyrate, black horns; the face tapering; nose simple; tear-bag none; inguinal sinus none; interdigital pore small; tail very short; no knee-tufts: female hornless; teats two.

The RAGOA or GOA. *Procapra picticauda*.

Hair sordid brown, with pale rufous tips; underside, inside of ears, limbs and small caudal disk rufescent white; tail black; in winter upper parts canescent slaty.

Procapra picticauda, Hodgson, Journ. Asiat. Soc. Bengal, 1846 (173), 334. t.

Inhabits Thibet, in the plains. Not gregarious.

Mr. Hodgson kindly sent a specimen of this animal and some heads to the Museum; but unfortunately, the skins were destroyed by insects and damp during the transit from Nepaul. The skulls are very similar to those of the genus *Gazella*. The horns are more elongated and erect, but not so long as those of the *Chiru*. The shortness of the tail allies it to the Goat-like Antelopes.

[Insert after *Kobus Ellipsiprymnus*, page 15.]

The LECHÈ. *Kobus Lechè*.

Pale brown; orbit and beneath whitish; front of the legs dark brown; withers with a small, circular whorl of hair.

Kobus Lechè, Gray, P. Z. S. 1850, t.

Inhabits S. Africa. Called *Lechè*.

A fine specimen of this species, shot on the bank of the river Zoaga, lat. 21°, has been presented to the British Museum by Captain Frank Vardon, of the Madras Army. It is nearly as large, and has as large horns, as the *Water Buck* (*K. Ellipsiprymnus*), but is paler and brighter coloured, and has no indication of any white mark on the rump. It is allied to the *Kob* in appearance.

LORD DERBY has communicated the following notes and observations on the *Leucoryx* and *Addax* :—

“ In the year 1837, having been informed by Mr. Garnett of Welbeck Street, that a female Antelope (*Leucoryx*) was alive in the possession of a lady at Edmonton of the name of Musket, I drove down thither and was shown the animal, which, as I understood, had been brought to England about two years previously by the lady's son, but that having lately become rather troublesome, Mrs. M. would very willingly dispose of it; and I in consequence became the purchaser at, if I remember aright, the sum of £60. I then made all the inquiries I could in hopes of meeting with a male, though ineffectually. This was a female *Addax*. Subsequently I received a letter from Mr. G. M. Skinner, with whom I had not then the pleasure of being acquainted, in which he informed me that his brother, who had just returned from the Continent, had met with a person of the name of Reboulet on board the steamer, who had with him a few Giraffes and Antelopes for sale, and that Mr. Skinner, by his brother's intervention, had secured from M. Reboulet for me the refusal of these animals, having heard of the inquiries I had been making. I had in the interim seen a statement of such things in the public papers, and sent off immediately my head keeper (Mr. Thompson) to London, to inquire after them; who, on arriving there, found that they were still at Southampton, and sought them there; but as M. Reboulet had proceeded to London, could find no one to negotiate with on the subject, but ascertained that the three Antelopes, which alone I desired, consisted of a male *Leucoryx* and a pair of *Ant. Addax*. J. T. subsequently followed M. Reboulet to town, and with the assistance of Mr. Skinner succeeded at last in making an agreement with the Frenchman for the Antelopes, *without the Giraffes*, which he was very anxious to dispose of altogether, and all that remained was the payment of the price and delivery of the animals, which were still at Southampton. M. Reboulet kept postponing this last act, under the plea of going down with Thompson to Southampton to give them over to him himself; but, as from subsequent events it would appear, rather to afford him time to complete a bargain he appears to have been engaged in with some dealers to dispose of all the animals together in one lot; in which he at last succeeded, and sold the whole to Mr. Cross, though he knew that Thompson had the money agreed upon (£100) ready to pay to him on the delivery of the Antelopes, or authority to receive them from those who had them in charge at Southampton. The animals were at last brought to London, and given up to Mr. Cross, though claimed on their arrival at the station for me by Thompson; but I did not choose to enter into litigation on the matter, preferring rather to submit to the imposition which M. Reboulet had practised on me.

“ The Antelopes therefore remained with Mr. Cross till he retired from the Surrey Zoological Gardens, when they were transferred by him to his brother-in-law, Mr. Herring, of the New Road, from whom I finally purchased them for £110, and they have continued here ever since, and in 1844 each pair copulated. Early in the year 1845 the female *Addax* calved a young male, perfectly well and healthy, but to appearance very clumsily formed, especially about the head and neck, and of a light fawn or dun colour all over; the horns very small, sharp at the end and straight, but evidently strong, about half an inch in length, without the slightest curvature. It was very active, and has gone on ever since without the least drawback, and generally in the open air. Now (in Nov. 1845) it has become almost the size of its mother in bulk, though not in height; and the horns, as yet, show no signs of curvature. The mother took the male again in May (22nd), and we have every reason to believe that she is again pregnant.

“ The female *Leucoryx* went on regularly, with every appearance of doing well, till after the *Addax* had

calved; she then seemed to become ill in herself; and after some time, during which it was very doubtful whether we should not have lost her, she produced a dead female, which was sent subsequently to the British Museum. From the period of parting with that she gradually, but quickly, improved, and took the male again August 29; which, as the fact has never been since repeated, and she has continued apparently in perfect health, we conceive has been effectual, and that she is again in the family-way: it is hoped under more favourable auspices than last time, but it must be remembered that she is now by no means a young animal. The male is believed to be much younger. He is at times very fierce, and certainly not fit to be too much trusted.

"I am glad to tell you that the report John has brought to me this morning is that the *Leucoryx* is a great deal better, but matters are not a whit further advanced. The period is not, however, so near as you appear to suppose, for by what I can learn she is still a fortnight short of what we suppose her full time, and I confess I for one have little or no hopes that the produce may be saved, and shall feel well satisfied if the mother is preserved. She is, however, an old animal, and therefore the chance of her breeding again is but small, which makes this young one of much more importance."—May 6, 1845.

"The *Leucoryx* is very large, but will yet go some time."—May 16, 1845.

"I am sorry to say I have more bad news to communicate. Yesterday afternoon John came with a very long face, to say that the *Leucoryx* was very ill; had taken her supper very well on the previous night; but that morning had refused her breakfast, and was since in a very shaky, shivering state, evidently in labour; but he feared the young one was dead, and she could not part with it. We sent for Lyons the farrier, and they sat up with the poor lady all night, and she is still much in the same state; but her eye is clear, and this is the only good sign I can make out. They expect to have to sit up with her again tonight; but I fear we must lose the foal even if we can save the dam, which I will hope for.

"I will give you the latest intelligence of madam before I close this tomorrow."

"Wednesday.—I can add nothing more yet about the *Leucoryx*: John has been with me, and reports her to have been very bad and in much pain in the night, but thinks her now neither better nor worse. He is gone to Liverpool for another Veterinarian, and we must remain in longer suspense."—May 21, 1845.

"I am glad to tell you the *Leucoryx* continues to progress well, and I do really now begin to have hopes of final success; but even if otherwise, I fear I cannot promise you either the young one or the defunct *Wombat*, as I must keep them for myself."—May 23, 1845.

"I am glad to be able to continue my good reports of Mrs. *Leucoryx*, to whom I have been paying my first visit since her illness, and I was agreeably surprised by her looks; in fact, had I not known the circumstances, I should have seen no alteration in her since I last saw her just before, *i. e.* a day or so before, her illness. She is certainly much thinner, but that is not to be wondered at, as she ate nothing for five days. You may rely on having the calf and *Wombat* if any one but myself has them."—May 31, 1845.

"The long-pending event has at last been settled, and the young foetus has been at last obliged to be removed from the mother: she is of course unwell, but doing as well as we can expect. The young proved to be a female, which adds to my regret. They were obliged to separate the fore-legs to get it away, but John assures me that no part whatever has been lost; but all is sent to you, or will be sent this day, and I hope will reach you in tolerable good state for your object."—June 19, 1845.

"I wish I could hear that he (Frazer) had secured any *A. Leucoryx* or females of *Addax*, as I am much afraid we shall lose my old *A. Leucoryx* female, and have lost the female *Addax*."—June 30, 1846.

"Do you know the period of gestation of the *Leucoryx*? I heard from John to day, who says the time is eight months, as he supposed our lady would produce by the beginning of June 1846."

"You will be sorry to hear my *Leucoryx* is dead. I have still a male, but an old animal, for I have had him nine years.—She was, I believe, the only female in England."—July 2, 1846.

"I have just been speaking to John about the extra points you wish to know as to the *Addax* and *Leucoryx*. He considers the period of gestation to be in both like the great mass of Antelopes, eight months, but he cannot speak so well in this matter about the *Leucoryx* as of the *Addax*. The young of the latter was at first very different in colour from the adult, being *wholly* of a light sort of chestnut, and very like a young Reindeer in make. It commenced to assume the parental colours at nearly two months. The horns are only beginning to copy the parents, and to fall backward from the base. He stated that he had endeavoured to measure their length, and I think he said that it was about 12 inches. The old pair change much with the season in the shade of their colours; and he tells me, what I have not noticed myself, that their horns also are very different from each other, the male's head not being nearly so good as his wife's: her's are much wider apart at the tips; his, on the contrary, come much closer. I have not noticed this last particularly myself, though I have observed the general superiority of her head.

"Thompson has suggested to me to point your attention to one species, the Harnessed, which differs from all other Antelopes in the gestation, or rather subsequently. In the actual gestation it, like the others, occupies eight months, but she will receive the male again in another month, and he believes the young female will receive him as early as at nine months old."

"I now send you the memorandum which I lately announced to you relative to the *Leucoryx* and *Addax*,

having first submitted them to the supervision of Thompson as to dates, &c. I am glad to tell you that he reports them generally correct, though you will see I had made slight confusion, as I never purchased any of the *Leucoryx* but the pair I have now, of which we consider the male as not above four years, while the female is perhaps ten or eleven. What I bought of Wombwell was an *Addax*. As to Reboulet's animals, Thompson's first agreement with him was, to purchase the three Antelopes without the Giraffes (with which I throughout the whole business steadily refused to meddle, though Reboulet made many appeals to me to take them also), at the price of £100 for the three; but to this I was afterwards obliged, when I bought them of Herring, to add £10 or £20 more, I forget which exactly. Let me know if any other point occurs to you as desirable to be noted which I may have omitted."

"The young *Addax* is so unlike an Antelope!

"I have not been able to see my young things yet, on account of the weather, and am anxious to see the *Addax*, which I fear begins already to show signs of change in his coat. Hawkins has commenced a drawing of this set, papa, mamma and son.

"I am sure you will be glad to know that we have a young *Addax*. It was born about two days since, and is, I am sorry to say, a male, but is very strong and promising. I forgot to say, the young *Addax* is quite unlike the adult, is very strong made, with large head, and all over of a red sand colour, except on the chest, where there seems a darker, brownish spot. I think it would be worth while securing its representation in its present state for comparison.

"The young *Addax* has as yet no change in his horns, but it is early day. His mother is beginning to show large again; indeed, she is to calve about Christmas: not the best time you will say, but we could not well manage it otherwise. My *Addax* goes on charmingly, and the young one thrives regularly. My *Addax* has taken the male, and we hope is with young. This time it must be a female."

"I found most of John's family going on prosperously here, and on Wednesday paid a visit to Master *Addax*, who is growing a very fine fellow, and his horns are now about 5 inches long."—May 16, 1845.

"By the way, my young *Addax*'s horns have as yet very little altered, and the horns of his parent differ very much from each other. The young one's have begun to recline a little, but in no degree to assume the corkscrew of the parent. They are still very straight, though not so erect.

"John has just brought me the bad news that the female *Addax* ~~has~~ died last night: she had a well-grown and promising young male in the inside. He saw she was not right yesterday; her eyes dull and her coat staring rough; but she fed well, though it did her no good. The medicine he gave her answered well, but seems to have been too late. On examining, her stomach appears to be extensively disordered, with some, but not much, inflammation, and some small rupture of the stomach, which, if I understand him aright, seemed not to be recent; but the whole inside was full of water bladders in great quantities. What say you? Will these, as they are, be of any use to the British Museum? Thompson has not consulted your list, but will let me know in the morning, and if so it will be forwarded at once. It is better for me that the young was not a female."—Jan. 18, 1846.

"By the way, have you noticed the horns of the female *Addax*? They struck us here as growing very differently from the male.

"The reason I called your attention to the horns of the *Addax* was, as so much stress is generally laid on the variations of the curvation in the Antelopine horns; and yet, here are two sexes of the same species certainly very much varying from each other, though sufficiently alike in general resemblance.

"I have inserted the *Addax* in the list, but females only, as I have now here two males.

"I send you at the same time a fresh drawing of the young male *Addax*, which is now nearly, if not quite, a twelvemonth old, and you will observe has not yet assumed the parental flexure. Does not this somewhat invalidate the strength of this feature as a distinctive character between the species? It seemed to me a fact well worth being established and recorded, and therefore I determined to have this additional drawing taken."—April 16, 1846.

THE STREPSICERES.

THIS family, defined in the preceding pages, are peculiar as being the only hollow-horned or Bovine Ruminants which are marked with white stripes and spots. The bands are not very distinct in the *Impoofa* or *Eland*, but they are easily to be observed in the female, if it is looked at obliquely, which was brought home by Burke, and presented to the British Museum by the Earl of Derby. Their nostrils are near together in front. They have four teats in a small udder. The horns generally incline backwards from their base; the skull, which somewhat resembles that of the Deer, has a rather small nasal opening, no suborbital pit, and only a small suborbital fissure.

Colonel H. Smith forms of the larger species three of his four subgenera of *Damalis*: he places the smaller kinds as a subgenus (*Tragelaphus*) of Antelopes.

Professor Sundevall placed the genera I have here brought together in two different families; the genus *Portax* with the *Bovina*, and the others in the *Sylvicaprina*, or True Antelopes.

THE AFRICAN GENERA have large heavy horns, only the rudiments of a tear-bag, and their limbs are nearly equal; they have no supplementary lobes to the grinders, and the central cutting-teeth are enlarged above.

* *The nose hairy, cervine, with only a small moist naked space between the edges of the nostrils, and a narrow streak on the upper lip; the body is large, heavy; the neck is maned.*

1. STREPSICEROS (*H. Smith*), CALLIOPE (*Ogilby*), TRAGELAPHUS, sp. (*Blainv.*),

with large, heavy, spirally twisted horns, keeled in front; tear-bag a naked space; throat with a central, linear mane: female hornless.

THE EECHLONGOLE OR KOODOO. *Strepsiceros Kudu*. TAB. XXIV. fig. 2. Young.

The horns diverge from the line of the forehead, and have two twists; the calf is marked like the adult.

Antelope Strepsiceros, Pallas.—*Damalis (Strepsiceros) Strepsiceros*, H. Smith, G. A. K.—*A. Tendal*, Ruppell, Abyss. 22.—Fischer, Syn. 475.—*Strepsiceros Kudu*, Gray, Cat. B. M.—*S. Capensis*, Harris, W. A. A. t. 20.—*S. excelsus*, Sundev.—*Striped Antelope*, Penn.—*Comdoma*, Buffon, H. N. xii. t. 39; Supp. vi. t. 13.

Inhabits S. Africa; Abyssinia.

In the Frankfort Museum there is a male and female adult, a half-grown and young specimens; in the India House Museum is another specimen, all from Abyssinia. They do not appear to differ from the Cape specimens, except in being smaller.

2. OREAS (*Desm.*), BOSELAPHUS, sp. (*Blainv., Gray*), DAMALIS (BOSELAPHUS), sp. (*H. Smith*), DAMALIS (*Sundev.*),

with large, erect, slightly curved horns, with a spiral keel; throat with a longitudinal, crested dewlap; hoofs narrowed in front. Female with smaller, thinner horns.

I formerly adopted the name of *Boselaphus*, which Blainville had used for the genus, but Ray had previously applied this name to the *Bubale*, and Desmarest has formed a subgenus specially for it under the name of *Oreas*.

The IMPOOFO OR ELAND. *Oreas Canna*.

Pale brown.

Antelope Oreas, Pallas.—*Damalis (Boselaphus) Oreas*, H. Smith, G. A. K. t. 200.—*A. Oryx*, Pallas, Misc. 9.—*D. Boselaphus Canna*, H. Smith, G. A. K. t. 181. f. 5, horn ♂.—*Coudou*, Buffon, H. N. xii. t. 46 b.—*Canna*, Buff. Supp. iii. t. 12.—*Eland*, Kolbe, Sparmann, K. Vet. Handl. 1779, t. 8.—Harris, W. A. A. t. 6.—Daniel, Afr. Scenery, t.

Inhabits S. Africa; Cape of Good Hope (*Sparmann*).

This Antelope has much the character of the Oxen, and Dr. Burchell informs me that it is the best food of any of the genus at the Cape, being the only one which is moist and has any fat intermixed with the muscle; the flesh of the others is dry and hard. At Knowsley it breeds with the facility of domestic cattle, but they are ravenous feeders, and appear liable to an epidemic.

It should be remarked that the skin of the specimen shot by Burke at the Cape (the female especially) shows several pale whitish cross-bands on the hinder half of the body, similar to the streaks on the *Koodoo*, showing the affinity of this animal to that species; but I could not observe these bands in the living specimens at Knowsley Park.

The GING-E-JONGA. *Oreas Derbrianus*.

Pale reddish-brown; front of the face, the neck, the front part of the under side, a spot on the front and hinder side of the upper part of the fore leg, the dorsal streak, dark black; the belly, the front and back edge of the upper part of the legs and under side of tail whitish; a broad half-collar in front of the shoulder, narrowed above; fourteen or fifteen narrow, waved, perpendicular streaks on each side of the body white; withers with intermixed black hairs; female throat dark brown; crown reddish brown.

Boselaphus Derbrianus, Gray, Ann. and Mag. N. Hist. xx. 286.—Silliman's Amer. Journ. v. 279.

Inhabits W. Africa.

Mr. Whitfield brought from Gambia two pairs of very large horns of the male of this species, and a single horn of a younger male. He has since brought two skins without heads, a male and a female, which are now in the British Museum. They are rather larger than the *Impoofa* of the Cape.

They are found on the River Casaman and some of the creeks at the back of the Gambia, and are called *Ging-e-jonga*.

** The nose bovine, with a large coriaceous moist muffle, and a narrow bald space on the upper lip. The animals have very slender, elegant legs; small hoofs and false hoofs; conical, subangular horns; with an oblique, indistinct keel.

3. TRAGELAPHUS, ANTILOPE (TRAGELAPHUS), (*Blainv.*, *H. Smith*),

with conical, subangular horns; tear-bag distinct; nape and back with a more or less distinct mane: they are brown; with spots on haunches, crescent on chest, and inside of legs white, and a dark dorsal stripe.

* Face with a curved band between the eyes; horns large; back cross-banded. *Euryceros*.

The EURYCEROS. *Tragelaphus Euryceros*. TAB. XXIII. fig. 1. Horns.

Head pale brown; broad band before the eyes, and two large spots on cheeks, chin and front of upper lip white; horns elongate, thick, scarcely bent forward at the tip; throat with long black hairs.

Antelope Eurycerus, Ogilby, P. Z. S. 1836, 120.—*A.*, n. s., Afzelius, N. Act. Upsal. vii. 269. t. 8. f. 3.—H. Smith, G. A. K. v. 361.

Inhabits W. Africa. Horns. Brit. Mus. and Zool. Soc.

The INYALA. *Tragelaphus Angasii*.

Black; back with a dorsal streak and four or five bands on each side; head blackish; narrow band before eyes, two small spots on cheeks, front of upper lip and chin white; forehead and feet bay; throat with a mane of long rigid blackish hair; horns rather slender, elongate, rather bent forward at the tip; female bay, with many white bands.

Tragelaphus Angasii, Gray, P. Z. S. 1848, 89. t. 4 & 5. Male, female and young.

Inhabits S. Africa; Port Natal. Brit. Mus. male.

** *Face without any frontal streak; horns small.*

† *Back with transverse white stripes.*

The ZALOFES OR HARNESS ANTELOPE. *Tragelaphus scripta*.

Pale bay; back with four cross-bands and a central white streak; haunches white spotted; cheek with two white spots; spot on chest, nose, feet, and spots on the legs blackish; dorsal streak and end of tail black. Adult: chest and outside of shoulder and haunches and legs black: the male with a high ridge of long, coarse white hair extending the whole length of the back to the tail.

Antilope scripta, Pallas, Misc. 8.—*Antilope (Tragelaphus) scripta*, H. Smith.—*A. maculata*, Thunb.—*A. (Tragelaphus) Phalerata*, H. Smith.—*The Harness Antelope*, Pennant, Syn. 27.—*Guib*, Buffon, H. N. xii. 305, 307. t. 40. t. 41. f. 1.—F. Cuv. Mam. Lithog. t. ♀; Dict. Sci. Nat. t. ♂.

Inhabits W. Africa; Senegal and Gambia. Called *Oualofes* or *Zalofes*.

The dark colour of the chest and outside of the limbs, and the high crest of the male, are not developed until they are four or more years old.

This species varies in some having seven and others nine white cross bands, and some are spotted and others not; but they breed together, and the produce is often a different variety from the parent.

They breed constantly at Knowsley: in May 1845 they had a small herd of two males and four females, three of which were expected to bear young.

The DECULA. *Tragelaphus Decula*.

Grey brown; back with three or four indistinct cross bands; an arched streak on upper part of side, a few spots forming an arch on the haunches; dorsal line, streak on nose, and in front of fore-legs blackish.

Antilope Decula, Ruppell, Abyss. t. 4.

Var. Back without the cross bands.

Inhabits Africa; Abyssinia (*Ruppell*).

†† *Back without any cross bands or lateral streak.*

The BOSCH BOE. *Tragelaphus sylvatica*.

Blackish brown; head pale brown; back, across forehead, black; small spot on haunches, larger spot on insides of legs and on feet white; dorsal line longly crested, black, white varied in. Female paler brown. Young: pale bay.

Antilope sylvatica, Sparmann, Act. Holm. iii. t. 7.—*Tragelaphus sylvatica*, Harris, W. A. A. t. 26.—*Forest Antelope*, Pennant.

Inhabits S. Africa; Cape of Good Hope. Brit. Mus.

The two pairs of horns, named by Colonel H. Smith *Boselaphus canna* (*a, b*, in the List of Mam. Brit. Mus. 155); one, presented by Dr. W. Burchell, is certainly the horns of this species, and the other appear to be those of a young male, *Strepsiceros Kudu*.

The ASIATIC STREPSICERES have a bovine nose, with a large coriaceous moist muffle extending over the whole front of the upper lip; small, short, angular horns; a deep longitudinal tear-bag; and the hind-legs much shorter than the fore-ones; the skull without any suborbital pit, and only a minute fissure; and with supplementary lobes to the grinders.

4. PORTAX, OREAS, sp. (*Fischer*), TRAGELAPHUS (*Ogilby*), DAMALIS (PORTAX) (*H. Smith*),

with horns short, conical, angular, with an obscure oblique ridge; tear-bag deep, longitudinal; shoulders higher than the rump.

The NYLGHAU. *Portax Tragocamelus*. TAB. XXIX.

Grey; under surface, rhombic spot on the forehead and above the hoofs black and white ringed; tail, end black. Female browner. Young: dull reddish fawn; lower part of fore-legs brighter; under lip, spot on jaws, and line along belly on inside of legs and fore-part of hock, white; tip of tail, line on back of nose and on front of legs black.

Antilope Trago-camelus, Pallas, Misc. 5.—*A. picta*, Pallas, Spicil. xiii. 54.—Gray, Cat. B. M.—*A. albipes*, Erxl. 280.—*A. leucopus*, Zimm. Zool. 541.—*Damalis (Portax) Risia*, H. Smith.—*P. picta*, Gray, Cat. B. M.—*Tragelaphus Hippelaphus*, Ogilby.—*P. Tragelaphus*, Sundev.—*Biggel*, Mandelst. Reise (1658), p. 122.

—*Tragelaphus Cavi*, Raii Syn. 82?—Parsons, Phil. Trans. No. 476. p. 465. t. 3. f. 9.—*Nylghau*, Hunter, Phil. Trans. lxi. 170. t. 5 ♂.—*Nilghaut*, Buffon, N. H. Supp. v. t. 10, 11.—F. Cuv. Mam. Lithog. t. 3 ♀.—*Indostan Antelope*, Penn. Syn. 29.—*White-footed Antelope*, Penn. Syn. 29. t. 6. f. 1, 2.

Inhabits India. The *Roou* of the Mahrattas, the *Nylghau* of the Persians.

This species has bred at Knowsley. In December 1845 they had two calves, both females, making a flock of one male and four females: they are in the paddock with the *Eland* in summer. They have also bred in the Gardens of the Zoological Society.—See *P. Z. S.* 1831, 37.

LORD DERBY in his Notes states:—

“I SENT to you a few days back an account of the breeding of our *Hog Deer* here, and promised to follow it with a similar statement relative to the Harnessed Antelopes, or *Guibe*.

“In the autumn of 1839 I purchased from Cross a female of the *Ant. scripta*, and I subsequently obtained two males; one in the following autumn (1840) from a gentleman who brought it from Africa in the same ship with Mr. Whitfield. By this male the female produced four fawns, and he died in December 1844; but his place has been well supplied by a second, which Mr. Whitfield brought to me from W. Africa, September 4, 1843. But this second male would appear, from the greater number of its white markings, to belong to another species, viz. *phalerata*, and such indeed it was considered by Mr. W.; but we here can hardly bring ourselves to the conviction that they are other than mere varieties. This second male has given birth to four fawns also, viz. two pairs. The first fawn produced by the old female was a male, fawned in February 1842, which died in a few days; the second, a female, was fawned in May 1843; the third, also a doe, fawned in August 1844; the fourth, a doe, fawned in May 1845; and the fifth, fawned I know not when, but she took the male 23rd of May last, and should fawn 23rd of January next. The first doe (produced in May 1843) has already fawned twice, a male in February 1844, and a female 20th of November last; she is also again in fawn, and should fawn 3rd of January. You will see that these are a very prolific race, and breed very rapidly, which I do not believe has ever been hitherto noticed by any of our savans. I began my stock with a single female in autumn 1839, and I now, in 1845, have a small herd of about ten, not reckoning two which Thompson will take up with him tomorrow for the Queen, who has graciously accepted them.

“I have now a good little herd of six *Harnessed Antelopes*, two males and four females, of which three are in young.”—May 22, 1845.

“The principal item that I obtained from the expedition upon which I sent Mr. Burke into the Interior of South Africa, or what I considered as such, was the *Eland*, or *Oreos Canna*, which was then, *as far as I know*, for the first time brought alive into Europe. Of this interesting species I received three individuals in November 1842, but, unfortunately, only one of them was a female. One of the males appeared at first to be rather weakly, but after a short period rallied, and has since proved a very good animal. On being first landed at the Docks in Liverpool the cow met with an accident, which I at first feared might have seriously interfered with my projects for the future: the cage in which she was placed having been set down on the stones of the Dockyard, while the attendants were disembarking the other things, she, perhaps excited by the noises around, or tired of the confinement, became uneasy, and in turning herself round struck one of her horns between the framework of the cage, and fairly broke it off close to the root; but did not seem to suffer from it either at the time, though a very small quantity of blood proceeded from the wound, nor has she ever since appeared the worse for it, except in appearance, as of course she has always continued an unicorn. The horn she lost is now in my museum. There is a difference in the form of the two males, and by Burke and his companions I am told that there are two distinct races of these Antelopes; a fact which appears to be well known in Africa, but which I never have found alluded to in any accounts of the animal yet published, one variety being longer-legged than the other, which is also heavier in the body. These characteristics are very plain in the two now in my possession, but there is evidently no real difference, as the cow has bred with each, and the produce appear to me as yet to show no difference. She bred first with the shorter-legged, August 31, 1843, and produced a male May 27, 1844; next, she took the longer-legged, date not kept, and produced another male March 10th last: she has again copulated with the shorter-legged, and should calve about January 17, 1846. Thompson says there is a difference in the calves, which each take after the sire. She is considered as

being herself of the longer-legged variety. The period of gestation has been, first time, 38 weeks 4 days; the second, precisely 39 weeks."

"One of my *Eland* bulls has served two of our domestic cows, an Ayrshire and a short-horn."

"A cow has been tried with the male *Eland*, but he fought her so she was obliged to be removed, to save her from being killed. I think she should have been brought and put with him for some little time before her coming in use."—June 11, 1844.

"Surely you do not consider the *Cephalophorus*, or indeed any Antelope, unless perhaps the *Elands*, amongst the *Bovideæ*. The *Elands* are in high force, but none of our cows have proved in calf to the bull *Elands*."

"I fear the experiment of a cross between the *Eland* with our domestic cattle will not succeed. I do not hear that any of the cows is in calf. I wish I had one or two more cow *Elands*; four to one is too large a proportion."—May 31, 1845.

"I am glad to report that the *Eland* cow is again in calf. I see no hopes of a mixed breed between the *Eland* bull and the common cows, as the latter were in danger more of being killed than any other treatment.

"By the way, I am sorry to tell you that my *Eland* cow has today produced another calf, and another male. Alas! I could have wished much it had been of the other sex; but it is very strong and healthy, and I hope we may in regard to it parody Cranmer's consolation to Henry the Eighth on Elizabeth's birth: 'This bull promises cows hereafter.'"

"We were very near having another very serious loss in the old female *Eland*, but by quickly applying proper remedies, she is now, we trust, out of danger. You are probably not aware that these animals are most voracious and almost insatiable. They are with us generally fed in their house, and when they are considered to have eaten sufficiently, are driven out into the paddock for exercise. In doing this, the old lady slyly kept back when the others went out; and as they had left some portion of the food in the trough, she managed, before her delay was observed, to clear off the whole, and was subsequently seized with a sort of bloat. However, being treated properly, she is now doing well again. This would have been a most serious matter a month or two back, before she had produced a daughter; but even with this advantage I should have regretted her loss, as even now we have but two females to three males, and there could have been but one addition at most next season; so that the establishment of the breed here would still have been very doubtful."—March 1, 1846.

"Thompson thinks Madam *Eland* is now quite safe again. His opinion is now, that she has been weakened by breeding too fast."—March 10, 1846.

"Mrs. *Eland*, I am glad to say, is all right again."

"My *Eland* cow is certainly in calf, as well as the *Bison* and *Leucoryx*, but the calf will come at rather a bad time of year."

"My five *Eland* and four *Wapiti* make a very pretty herd, and as yet agree very well; but when Mr. *W.* gains his full head, we must not expect it. They will be separated before then."—May 31, 1845.

"I know you will be glad with me to hear that Mrs. *Eland* has at last mended her ways, and has this time produced a young lady; so that I now begin to flatter myself that even without fresh importation we may look on the breed as established in this country. I now possess therefore, of this kind, four males and two females; and I am not without reasonable expectation that the application I had previously made to Cape residents may yet produce more. I have at this moment nine young things, all doing as well as possible here: three Harness Antelopes, three Hog Deer, two Nylghaus, and the *Eland*."

"On the return of Burke's expedition to S. Africa in October 1842, he brought home to me, with several other articles of natural history, three living *Elands*, two males and one cow, which are all now living in Europe. The cow and one bull were of the short-legged variety. On being landed on the quay at Liverpool in too small a wicker cage and struggling, she broke off one horn quite short, but has never suffered from it. Male No. 1. is the short-legged one; Male No. 2. is the long-legged one, and was sent to the Jardin des Plantes, December 1845. The following is their pedigree:"—

THE SHORT-LEGGED COW *ELAND*.

By Male No. 1.	By Male No. 2.	By Male No. 1.	By Male No. 1.
Served August 31, 1843.	Served June 10, 1844.	Served March 30 and April 7, 1845.	Served January 31, 1846.
a MALE calf,	a MALE calf,	a FEMALE calf,	
Fawned May 27, 1844.	Fawned March 10, 1845.	Fawned January 6, 1846.	

THE GOATS

ARE a small well-defined group, consisting of but a few species.

They have no suborbital sinus nor interdigital pits; forehead convex, elevated behind; horns are erect, compressed, curved backwards and rather outwards, and furnished with a longitudinal keel in front, deeper than wide at the base, with transverse knots in front; hoofs four-sided, scarcely higher before than behind; the skull has no suborbital pit, and only a small suborbital fissure; the grinders are without any supplementary lobes, and the cutting-teeth are not expanded at the tip.

The males have a strong stench; bleat; and they butt, first raising themselves on their hind-legs, and then coming down sideways with the weight of the body falling against their enemy.

The horns, like those of some varieties of sheep, have an inclination to twist more or less spirally, and they then assume the form of the *Strepsiceres*.

They are divided only into two genera.

1. HEMITRAGUS (*Hodgson*), HEMICAPRA (*Hodgson*), KEMAS (*Ogilby*, not *H. Smith*).

Nose cervine, with a small, moist muffle between the nostrils; horns short, recurved; interdigital and sub-orbital pores none. Female: horns smaller; teats four. Odour like the Goats.

This genus only contains two species, found on the mountains of Asia.

* *Horns thick, subquadrangular, rounded on the outer and flat on the inner side in front, closely ringed.*

The WARRYATO. *Hemitragus Warryato*.

Head dark brown, yellow grised; "back with a dirty white patch." Female yellower; back without the patch; horns smaller. Young kid ash-grey.

Capra Warryato, Gray, Mag. N. H. 1842, 267.—*Kemas hylocrius*, Ogilby, P. Z. S. 1837, 81 (the female).—Blyth, Ann. N. H. vii. 259, note.—*Cap. hylocria*, Schinz.—*Warryato or Hill Goat of the Tamooleans*, Hardw. Icon. ined. Brit. Mus. n. 10,775. t. 192, 193.—*Wild Sheep of Tanasserim*, Low, Journ. Roy. Asiat. Soc. 1836, 50?

Inhabits India; Nilgherries. R. Partridge, Esq. Brit. Mus.

My friend Mr. Robert Partridge has furnished me with the following notes on the habits of this animal:—

"*Ibex of the Nilgherry Hills*.—This animal is an inhabitant of the Nilgherry Hills, and the continuation of the western range of the Ghauts to their termination. Its habits resemble those of the European Ibex, living in like declivitous and inaccessible places, and with a similarity of watchfulness and delicacy of smell. They are generally seen in herds of from fifteen to forty or fifty. The adult male grows to the height of nearly three feet, the female some six inches less. The colour of the hair, both in the male and female, will be seen from the specimens sent; but it may be observed, that with age the black points in the male increase, and there will be seen in the male specimen an approach to a greyish white patch in the back, which with age also gets nearly a dirty white, and is particularly distinguishable at a distance: the colour of the female does not appear to alter: the young male is nearly the colour of the female, without any black. The horns in the male grow to the length of 20 inches; those of the female I have never seen more than 12. No beard in the male has yet been discovered. It has the blast and whistle of the Chamois when alarmed. The females have one kid at a birth, of an ashy grey colour. A species of rot prevails amongst them, which in some years carries off great quantities."

** *Horns compressed, triangular, shelving on the outer side, and rather nodulose.*

The JHARAL or FEHR. *Hemitragus Jemlahicus*.

Brown.

Capra Jemlahica, H. Smith, G. A. K. iv. t. 194. v. 358.—*C. Jemliaca*, H. Smith, G. A. K. iv. t. 183. f. 1, skull.
—*C. Jharal*, Hodgson, Asiat. Res. 1833, t. 3.—Schinz, Sys. Verz. ii. 462.—*C. quadrimammis*, Hodgson.
—*Hemitragus Jemlaiceus*, Hodgson.—*Kemas Jemlaicus*, Blyth, Ann. N. Hist. vii. 259, note.—*C. tubericornis*, Schinz, Sys. Verz. ii. 467.

Inhabits India; Nepal.

Schinz (Sys. Verz. ii. 467) confounds this species with *Capra Ægagrus Cossus* of Blainville, regarding *C. Jharal* (p. 462) as distinct. The *Jharal* has bred with the tame goats (*Hodgson*).

2. CAPRA.

Nose ovine, hairy, without any naked muffle; horns elongate, rather compressed, recurved or subspiral, keeled and knobbed in front; tear-bag and inguinal pores none; forehead convex behind; hoofs squarish, scarcely higher before than behind; tail very short, flattened; chin of male bearded, especially in winter. The older animals, especially the males, sometimes have a narrow naked coriaceous muffle on the front edge of the nostrils.

This genus may be divided into sections:

The IBEXES. The horns recurved, subquadrangular, front wide, with cross ridges.

The TURS. The horns subspiral, subcylindrical; front wide with cross ridges.

The GOATS. The horns recurved (or subspiral), compressed, with sharp nodose keel in front.

* *Horns elongated, recurved, subquadrangular, broad, crossed with transverse ridges in front, and rounded on the outer side; the forehead and ears densely hairy. Ibex or Steinboc.*

The STEINBOCK or IBEX. *Capra Ibex*.

“Horns of the male very strong, thick, subquadrangular, transversely rugose, flattish, nodose in front; of female, small, compressed, slightly nodose. Fur in summer short, adpressed, without any under coat, ashy grey; in winter, elongate, fulvous brown, with long dense intermixed underfur; beard short, brown, in summer wanting.”—*Schinz*.

Capra alpina, Gestanner.—*Capra Ibex*, Linn. S. N.—Schinz, Nov. Mem. Soc. Helv. ii. t. 2, horns, 1838.—*Bouquetin*, Buffon, H. N. xii. t. 13, 14.—Mam. Lith. t. —*Ibex*, Knight, M. A. N. f. 667, 668, 669, bad.

Inhabits S. Europe; Switzerland.

The JAELA or BEDEN. *Capra Nubiana*.

Fulvous grey; dorsal line and sides of tail blackish; beneath white; feet black and white spotted; ears three-streaked. Male beard black; horns very long, subtriangular above, knotted, reclinate on the back. Female beardless; horns slender, smooth, rather compressed, apex slightly inclined.

Capra Nubiana (*Bouc de la Haute Egypte*), F. Cuv. Mam. Lith. t. —Gray, Spic. Zool. t. 2.—*C. Arabica*, Mus. Vind.—*C. Jaela*, H. Smith, G. A. K. v. 869 (not figure).—*C. Sinaitica*, Ehrenb. Sym. Phys. t. 18.—Gene, Mem. Turino, xxxvii. t. 2.—*Capra Beden*, Schinz.—*Capra Ibex* (*Bæden*), Forskael, Faun. Arab. iv.—*Cretan Wild Goat*, Belon fig.

Inhabits N. Africa. Brit. Mus. “Crete. Königsberg Museum” (*Blasius*). Senegal. Mus. Paris.

The WALIE. *Capra Valie*.

Horns thick, nodose, subrhomboidal at the base; forehead with a protuberance in front. Brown, beneath whitish; feet white; legs and feet with a black mark in front; beard moderate.

Capra Valie, Ruppell, Abyss. Fauna, t. 6.

Inhabits Abyssinia. Mus. Frankfort.

Very like *C. Nubiana*, half-grown; but Dr. Ruppell thinks the prominence in front of the forehead peculiar.

The TEEK or TAKIGA. *Capra Sibirica*.

Pale grey; sides of lower jaw blackish brown; ears oblong; beard large, dependent.

Ibex Sibiricarum, Pallas, Spic. Zool. xi. t. 3; t. 5. f. 4.—*Capra Ibex*, Schreber.—*Ægoceros Ibex*, Pallas, Z. R. A. i. 224.—*C. Ægagrus*, Hutton, Calcutta Journ. N. H. ii. 521. t. 19?—*C. Sibirica*, Schinz, Nov. Mem. Soc. Helv. ii. t. 2, horns, 1838.

Inhabits Siberia; Altai Mountains. Brit. Mus.

The SAKÉEN. *Capra Himalayana*.

Brownish grey colour, with dorsal stripe, band on the shoulders, and the anterior part of the limbs dark brown or black; tail and beard black.

Capra Himalayana, Schinz.—Verz. ii. 463, 1848.—*Ægoceros Skyn*, Wagner.—*Himalayan Ibex* or *Skeen*, Hutton, Calcutta Journ. N. H. ii. 542.—*Sky* and *l' Danma*, Moorcroft, J. A. S. Calcutta, 1839, 928. v. 242.—*Skyn*, *Skeen*, *Saken* or *Siken*, in Thibet.—*Kyl*, in Kashmir, Vigne, Travels, i. 311.—*Capra Sakeen*, Blyth, P. Z. S. 1840, 80; Journ. Asiat. Soc. Calcutta.

Inhabits Himalayan; Little Thibet. Horns in Brit. Mus.

Horns are much longer and considerably less divergent, and resemble those of the Egyptian *Ibex* in curvature, excepting towards the base. They are less massive than the Swiss *Ibex*, the middle part being narrower, and the tips, which incline more abruptly somewhat forward and inward, are much more attenuated or drawn out. Length 4 feet 6 inches over the curvature and 10 inches round the base, diverging 1 foot 11 inches asunder at nearly three-fourths their length, and 1 foot 4 inches apart at the tip; at a distance of 1 foot 8 inches from the base inside they were 4 inches deep, 2 feet 6 inches broad in front at the base: length of skull 1 foot. Beard not small, as first described by Mr. Blyth, but forms a large conspicuous tuft, as in *C. Ægagrus*, *C. Jaela* and others (*Blyth*). It yields the delicate silky wool called *poshm* (*Vigne*).

The BORZ. *Capra Borz*.

Horns long, with broad knobs in front; chin bearded.

Capra Ægagrus, Hutton, Calcutta Journ. N. H. ii. 521. t. 19.—*Borz* of the Affghans.—*Wild Goat* of Affghanistan.

Inhabits mountain districts of Affghanistan; Persia. Perhaps the same as the former.

Horns of the *Ibex* are attached to the Zearuts and places of sacred note in Affghanistan.—*Bengal Journ.* 1841, 978.

The TURS have very large subtriangular horns, with transverse tubercles, very thick at the base, and conically attenuated, acute and greatly converging at the tip.

The PYRENEAN IBEX. *Capra Pyrenaica*.

Horns thick, rather triangular, rounder and nodose in front, keeled behind: fur brown; sides ashy brown; sides of head black brown; beard, dorsal line, upper part of tail, front of neck and front of feet and middle streak beneath black or ashy black.

Capra Pyrenaica, Schinz, Nov. Mem. Soc. Helv. Sci. Nat. ii. t. 1. f. 1, 2, skull, 1836; t. 2, animal and horns; t. 3, skull; t. 4, young; Verz. ii. 457.

Inhabits S. Europe; Pyrenees. Brit. Mus.

The CAUCASIAN IBEX OR TUR. *Capra Caucasica*.

“Wool chestnut-brown; beard of male long; horns black, wrinkled, moderately thick, semicircular behind and descending externally, the tip turning upwards and inwards, the base almost triangular, middle roundish, end compressed. Female with no beard; horns small, with a slight curve.”

Capra Caucasica, Guldens.—Pallas, Act. Petrop. 1779, ii. 273. t. 17 *a, b* (female and head of male), cop. Schreb. Saugth. t. 281 B.—Keyserlin and Blasius, Wirbelth. Eur. 28.—*Ægoceros Ammon*, Pallas, Zool. Ross. Asiat. 229. t. —*Ovis cylindricornis*, Blyth, P. Z. S. 1840, 78.—*Capra Ægoceros Pallasii*, Rouillier, Bull. Mosc. 1841, 910. t. 11.—Wagner, Suppl. 497.—Schinz, Nov. Mem. Soc. Helv. Sci. Nat. ii. t. 1, animal.—Verz. ii. 459.

Inhabits Caucasus.

The GOATS have recurved (or rarely subspiral), very compressed horns, with a narrow, sharp nodose keel in front, and flattish shelving outer side.

The GOAT. *Capra Hircus*.

Grey or reddish grey, sides reddish, brown mixed; front of head, dorsal line and tail black. Female horn none or rudimentary.

Capra hircus, Linn. S. N.—*C. Ægagrus*, Gmelin, Schinz, Nov. Mem. Soc. Helv. S. N. ii. t. 1, skull, 1838.—Cuv. Menag. Mus. t. (hybrid?).—*Ægagre*, F. Cuv. Mam. Lith. t. ♂ ♀ and young.—*Capricorne*, Buffon, H. N. xii. 146. t. 15.—*Capra Capricornus*, Meyer, Erxl.—*C. Ægagrus*, Pallas, Spic. Z. xi. 45. t. 5. f. 2, 3, skull

and horns.—Schreb. t. 282.—*Capricorne Goat*, Penn.—*C. Æ. Capricornus*, Gmelin, Fischer.—*Ægoceros Capra*, Pallas.—Wagner.—*Pasen*, Kæmpt. Amœn. 398. fig. at p. 407.

Inhabits Caucasus. Brit. Mus.

There are many Domestic Varieties. The following have been designated; they are divided according to the nature of their fur, but this is liable to change according to the climate; for Dr. Gardiner observes, "Goats in Brazil lose the long hair natural to them in cold countries, which proves how much the economy of animals can suit itself to change of circumstances."—*Travels*, 163.

A. *Wool Goats, with erect small ears.*

1. THE COSSIA. *Capra Ægagrus Cossia* (Buchann. Icon. ined. t. 10). White; feet pale brown, horns paler, short, recurved.

C. Æg. Cossus, Blainv.—*C. Ariès Cossus*, Fischer, &c.—*C. Tubericornis*, part Schinz, 467.

Inhabits India; Sylhet (*Buch.*).

Schinz confused the *Hemicapra Jemlaica* with this variety.

2. SHAWL-GOAT OR CHANGRA. *Capra Ægagrus Changra* (Buchann. Icon. ined. t. 11; Hodgson, Icon. ined. t. 173. f. 1. t. 174. f. 1. t. 175. f. 1, 2).

C. A. laniger, Desm.

Inhabits Nepal.

3. LESSER SHAWL-GOAT. *C. A. Chapa* (Hodgson). White black varied; horns suberect, subspiral.

Bouc de Cashemire, F. Cuv. Mam. Lith. t. —*Cashmere Goat*, Mus. Anim. Nat. f. 664, 665.

Inhabits India; Cashmere (*Buch.*).

4. KHASSIA HILL-GOAT (Robinson, Assam, 99) is usually clothed with long white rather coarse hair.
Ears — ?

Inhabits Assam.

5. SPANISH GOAT. *Capra ecornis* (Schreb. t. 287 B.).

C. A. acera, Desm.—*Bouc sans cornes*, F. Cuv. Man. Lithog. t. .

6. PERSIAN GOAT. *Capra Persicus* (H. Smith, G. A. K. v. 306).

Inhabits Persia.

7. INDIAN GOAT. *Capra Æg. Indicus* (H. Smith, G. A. K. v. 307).

8. THE DOOGOO (Hodgson, Icon. ined. t. 171 ♂ ♀).

Inhabits Central Hill, Nepal; common domesticated.

9. THE SINAL (Hodgson, Icon. ined. t. 172), with hair and shorn.

Inhabits Nepal, Central Mountain Region; domesticated.

10. FOUR-HORNED GOAT. *Bouc à Quatre Cornes* (F. Cuv. Mam. Lith. t. ♂).

11. THE MARKHUR. Uniform yellowish brown, beneath whitish; lower part of legs from the knee and hough very pale, with a dark line in front; horns very large, more or less twisted, varying from the curvature of those of a Koodoo (*A. Strepsiceros*), only in an opposite direction, to the erect spiral of the Impofo (*Antilope Oreas*).

Capra Magoceros, Hutton, Calcutta Journ. N. H. ii. 521. t. 20.—*C. Ægagrus*, var. Blyth, P. Z. Soc. 1840, 80.—*Markhur of Cabul*, Vigne, Travels, Kabul, 1840, p. 86.—Lord, in Burns' Cabool, 386, 1842.—Blyth, Ann. N. Hist. vii. 196, note.—*Markhor*, Ray Soc. i. 65.—*Ægoceros Falconeri*, Wagner, Munich, Gel. Anzeit. 1839, ix. 430.—Weigm. Arch. 1841, 54.—*Capra Falconeri*, Wagner, in Hugel Kaschmir, iv. 579. t. .

Inhabits India; Mountains of Cashmere (*Dr. Falconer*).

Mr. Blyth justly observes, the horns of all domestic goats have a tendency to assume the spiral form, especially at the tip, and he has never observed this in the wild kinds; he further remarks that he has never seen two specimens of the Markhur with the horns alike. And further, "I consider (the Markhur) to be a

fine race of domestic goats, of remarkable large size, but otherwise not essentially different from the *Shawl Goats* of the same countries."—*Ann. N. H.* vii. 196, note. Called *Markhore* or *Snake-Eater* by the Affghans, *Marbul* at Cabul, and *Rewachi* of Little Thibet.

b. *Wool Goat, with large pendent ears.*

1. THIBET GOAT. *C. A. Thibetanus* (Desm.).

Chèvre de Thibet, F. Cuv. Mam. Lith. t. .—*Bouc de Cachemere*, F. Cuv. Mam. Lith. t. .
Inhabits Thibet.

2. ANGORA GOAT. *C. Angorensis* (Linn.). Horns spiral.

Bouc et Chèvre d'Angora, Buffon, H. N. v. t. 10, 11.—F. Cuv. Mam. Lith. t. .
Inhabits Angora.

3. SYRIAN GOAT. *C. mambricus* (Linn.).

Chèvre mambrine, Buffon, H. N. xii. t. 10.—*Long-eared Syrian Goats*, Knight, Mus. Ann. Nat. f. 661, 662, 663.

c. *Hair Goat, with erect ears and moderate legs.*

1. The BERBURA. *Capra imberbis Berbura* (Buchann. ined. t. ♂ ♀). Fur short; white brown varied and black marbled; legs black; beard none.

C. Æ. imberbis Barbara, Blainv. Bull. Soc. Phil. 1816.—*C. aries barbarus*, Fischer.—*C. Jemlaica*, var. H. Smith.
Inhabits India; Jumna (*Buch.*).

Blainville evidently has misread the name in Dr. Buchannan's Drawings.

2. COMMON GOAT. *C. Hircus*.

C. Capricornus, Meyer.—*Bouc*, Buffon, H. N. v. t. 8, 9; xii. t. 15, skeleton.
Inhabits Europe; domestic.

3. DWARF GOAT. *Bouc-nains* (F. Cuv. Mam. Lith. t. ♂ ♀).

Inhabits Africa.

4. AFRICAN GOAT. *C. A. depressus* (Linn.).

Bouc d'Afrique, etc., Buff. H. N. xii. t. 18 ♂. t. 190 ♀.

5. WHIDAW GOAT. *C. A. reversus* (Linn.).

Bouc d'India, etc., Buffon, H. N. xii. t. 20, 21, 22.

6. NAGA GOAT. Body marked with beautiful streaks.—*Robinson, Assam*, 99.

Inhabits Assam.

M. Cuvier (Menag. Mus. t.) figures a *Goat* he received from near Mont Blanc; it is probably a hybrid between the *Ibex* and the Common Goat, and has the figure, form and colour of the *Ibex*.

d. *Hair Goat, with long pendent ears and long legs.*

1. NEPAL GOAT. *C. A. Arietina* (Desm.).

Bouc de Nepaul, F. Cuv. Mam. Lith. t. ♂ ♀.
Inhabits Nepal.

2. The MAYKAY or MAYCAY (Buchannan, Mysore, i. 120. t. 5. f. 10).

Inhabits India; Mysore; Karnata; kept with the sheep.

3. EGYPTIAN GOAT. Pale brown; face very short; forehead very convex.

Capra Thebaicus, Fischer.—*C. Ægagus Thebaica*, Desm.—*C. Indica*, Gesner.—*Bouc de la Haut Egypte*, F. Cuv. Mam. Lith. t. .—*Capra Æ. Ægyptiacus*, H. Smith, G. A. K. iv. 308.

Inhabits Upper Egypt.

THE SHEEP.

THIS is a most natural group. Some zoologists have placed them in the same genus as the Goats, but they are easily characterized.

They have a flat or concave forehead; the horns more or less spiral, and wider than deep at the base, and are slightly annulated in front. The females are often hornless. The skull has a more or less deep rounded suborbital pit, without any fissure. The cutting teeth are nearly equal-sized and shelving, and there are no supplemental lobes to the grinders. The hoofs are triangular, and very shallow behind. They have distinct interdigital fossæ. Their habits are very different; the males do not emit any stench. They bleat, and fight by butting.

Blasius has remarked that the right horn of *O. argali*, *O. montana*, *O. Nahor*, *O. Aries*, *O. Musmon*, and *O. Vignei*, wounds to the left, but in the two latter species only slightly; while in *O. tragelaphus*, *O. orientalis*, *O. Burrhel*, and *O. Cyprius*, the right horn wounds to the right.

OVIS.

The forehead is convex; the horns are subtriangular, more or less spiral; they have a more or less distinct tear-bag, and more or less deep suborbital pit in the skull, but no fissure; the tail is generally short, or more or less elongated, but not tufted at the end.

The WILD SHEEP have a very short tail, and are covered with hair, often concealing a woolly undercoat.

* Throat or sides with a dark streak; tips of the horns bent inwards. Musimon.

The SHA or KOCH. *Ovis Vignei*.

Horns. A conspicuous fringe of lengthened blackish hairs down the front of the neck; rufous brown; face livid; lateral streak black; rings on lower part of feet dark; belly, ring above hoofs and back of the shanks white.

Ovis Vignei, Blyth, P. Z. S. 1840, 70; Ann. N. H. vii. 251. t. 5. f. 9, horns.—*Wild Sheep of Hindu Koosh*, Vigne, Journ. Asiat. Soc. Beng. 1840, 440.—*Ovis Cycloceros*, Hutton, in M'Clelland, Calcutta Journ. N. H. iii. t. 19.—Ray Soc. i. 64.

Inhabits Little Thibet; called *Sha* (not *Sna*); Sulimani Range, called *Koch* (Blyth); Affghans, called *Koh-i-poombar*.

The size of a large *Fallow Deer*, and having the swiftness of that family. Horns like those of the *Mouflon*, but larger, $32\frac{1}{2}$ inches long and 11 inches round at the base. The suborbital pit in the skull is deep and rounded.

The ARMENIAN SHEEP. *Ovis Orientalis*.

Horns of male subtrigonal, compressed and very deep, with strongly marked angles and cross striæ diverging backwards, with slight arcuations to near the tips, which incline inwards. Fulvous chestnut colour, darker on the back. Limbs and under parts whitish. Tuft of black and white hair above wrist. Male with a dark line of more lengthened hair on front of neck, widens into a patch on the chest.

Ovis Orientalis, Gmelin, Reise, Russland, iii. 486. t. 55.—Pallas, Spic. Zool. xii. 15. t. 5. f. 1, horns.—*Ovis Gmelini*, Blyth, Ann. N. H. vii. 250. t. 5. f. 8.—*Ovis Musimon*, Brandt & Ratz. Zool. Med.

Inhabits Armenia; Erzerroom (*Sir John MacNeil*). Mus. Zool. Soc. Male, female and young. Male in Brit. Museum.

The size of the Common Sheep.

The MOUFLON. *Ovis Musimon*.

Capra Orientalis, Brisson, R. A. 71.—Gmelin, Reiss. vii. 486. t. 55.—*C. Ammon*, Blumenb. Natur. x. 117.—Gmelin, part.—*Ovis Ammon*, Erxl. Syn. part.—*Ovis Musimon*, Schreb. t. 286 a.—*O. Aries fera*, Desm. N. D. xxi. 554.—*Capra Musmon*, Fischer, Syn. 488.—Bonap. Fauna Ital. 45. t. 1.—*Musimon*, Ray, Quad. 75.—*Tragelaphus*, Bellon.—*Mouflon*, Buffon, H. N. xi. 352. t. 29.—F. Cuv. Mam. Lith. t. 69.—Knight, Mus. A. Nat. f. 673, 674.

Inhabits; Corsica, males called *Mufro*, females *Mufra*; Sardinia, males called *Murroni*, females *Murva*, or both sexes, *Mufion*. Gardens, Zool. Soc.

In confinement it breeds with the Domestic Sheep, the mules being called *Umbri*.

Messrs. Brandt and Ratzeburg figured a specimen of Mouflon in the Berlin Museum brought from Cyprus, which Blyth thinks may probably prove a distinct species, and he therefore proposed to call it *O. Ophion*, because the horns have more the curvature of *Ovis Gmelini*, but are not so robust, and curve round gradually backwards from the base, instead of at first diverging straightly, as in the latter species; Blasius has named the same figure *O. Cypricus*: see also Bull. Soc. Moscow, 1841, 568. It may be doubtful if these three species are mere local varieties.

** Throat or sides without any dark streak. Horns large, heavy. Argali.

The ARGALI. *Ovis Argali*.

Ægoceros Argali, Pallas, Zool. Ross. Asiat. i. 224.—Tilesius, Nov. Act. Acad. Nat. Cur. xii. 279. t. 23, head.—Boganus, Nov. Act. Acad. Nat. Cur. xii. 291. t. 24, 25, skull.—*Capra Ammon*, Linn. S. N. i. t. 77, part.—*Ovis Ammon*, Erxl. Syst. 250, part.—Schreb. t. 288.—Blyth, P. Z. S. 1840, 77.—*Ovis Argali*, Pallas, Spic. xi. 3. t. 1, 2.—*Rupicapra arietinus*, I. G. Gmelin, Nov. Conn. Petrop. iv. 388. 53. t. 8 b. f. 2, 3.—*Ovis Hodgsonii*, Blyth, Ann. N. H. vii. 199; P. Z. S. 1840, 65.—*Siberian Goat*, Penn. Synn. 18.—*Wild Siberian Sheep*, Penn. Quad. i. 38.—*Argali*, Shaw, Zool. ii. t. 201.—*Argali* or *Bebier Savage*, Wangle, Nord Siberie, ii. 158, 168.—*Nahoor Sheep* (female), Hodson, Asiat. Research. xviii. t. —*Ovis nivicola*, Eschscholtz, Zol. Atlas, t. 1.

Inhabits Siberia; most northern part (*Wangle*). Nepal (*Hodgson*). Brit. Mus.

It would be very interesting to compare the animal from the most northern part of Siberia, where they are chased in winter, with those found in the Himalaya range. The Musk appears to have a similar extensive range. *Ovis Nivicola* is said to want the pale disk round the tail.

The suborbital pit in the skull is moderately broad and concave. Mr. Hodgson observes that it has a distinct tear-bag and distinct interdigital pores (*Journ. Asiat. Soc. Calcutta*, 1846, 308).

The BIG HORN. *Ovis montana*.

Horns ringed, nearly equilaterally triangular, bulging a little between the angles; the inner front angle obtusely prominent, the hinder double forming a second plane at a slight angle with the superior one, and the inferior angle much rounded off.

Ovis montana, Geoff. Ann. Mus. ii. 351. t. 60.—Schreb. t. 294 B.—Desm. Ency. Meth. t. . f. —Rich. Faun. Amer. Bor.—*Ovis Ammon*, Harlan, Faun. Am. 259.—*O. Pygarga*, H. Smith, G. A. K.—*O. Cervina*, Desm. N. D. H. N. xxi. 553.—*Ovis Canadensis*, Shaw.—*Big Horned Sheep*, Ord, Blainv. Journ. Phys. 1817, 146.—*Ovis Californica*, Douglas, Zool. Journ. iv. 332.—Blyth, Ann. N. H. vii. 199. t. 5. f. 5, horns.—*Berindo*, Forbes, California.—*Wild Sheep*, Venegos, California.

Inhabits California.

Mr. Douglas's horns of the *Californian Sheep* (in the Mus. Zool. Soc.) are smoother, and more openly spiral than the Rocky Mountain Sheep. Mr. Douglas describes the tail as 18 inches long, but this is probably a mistake.

The RASS or ROOSH. *Ovis Polii*.

Horns pale coloured, with the two front angles nearly equally developed.

Ovis Polii, Blyth, Ann. N. H. vii. 195. t. 5. f. 1, 2, horns.—*Ovis sculptorum*, Blyth, Ann. N. H. vii. 196. t. 5. f. 3, 4?—*Ovis Nahoor* (young Ram), Hodgson, Asiatic Res. xviii. t. . f. —*Rasse*, Burnes, Trav. Bokhara, ii. 208.—*Kutch-gar*, Wood, Sources of the Oxus, 368.—*Wild Sheep*, Marco Polo, 142.

Inhabits India; "Plains of Pamir, east of Bokhara, 16,000 feet above the sea level." Nepal, called *Bambhera*?

Horns larger and less massive than *O. montana*, more like domestic *O. Aries*, but differs from them in being larger, and having the two front angles about equally developed.

The DOMESTIC SHEEP have a more or less elongated tail, and are generally covered with wool, which sometimes falls off in summer, leaving a close-pressed coat of hair. Some races of warm climates are always covered only with hair. Horns triangular, ringed, spiral. *Aries*.

DOMESTIC SHEEP. *Ovis Aries*.

Ovis Aries, Linn. S. N. i. 97.—Amœn. Acad. iv. 169.—*O. domestica*, Brisson, R. A. 74.—*Capra ovis*, Blum. Nat.—*Musmon Aries*, Schrank.—*Sheep*, Penn.—*Brebis*, Buffon, H. N. vi. 1, 2.

The Domestic Sheep offer many varieties in the form and even in the number of the horns, and especially in the texture of their fur. Many, in cold and temperate climates, which are covered with wool when they are moved to a warmer climate, become permanently covered with short hair. Dr. Gardiner, in his Journey from Pernambuco to Crato, passed through a flock of several hundred sheep; “the excessive heat of the climate had wrought a remarkable change in their appearance, their skin being wholly destitute of wool, and replaced by a short hair not unlike that of a cow.”—*Travels*, 163. But some kinds, even in England, which have wool in the winter, are only covered with short adpressed hair in the summer. This is the case with the West India Sheep noticed by Mr. Blyth.—*Ann. Nat. Hist.* vii. 255. They also present several varieties in the form of the tail. The following are some of the varieties which have been noticed:—

1. SPANISH SHEEP (Shaw, Zool.).

Ovis Hispanicus, Linn. Amœn. Acad. iv. 174.—*Merino*, Desm. N. Dict. H. N. t. 918. f. 1, 2.—*Merino Sheep*, Knight, Mus. Anim. Nat. f. 682.—*British Middle Wooled Sheep*, Knight, Mus. Ann. Nat. f. 684.

2. COMMON SHEEP (Penn. Syn.).

Ovis Rusticus, Linn. Amœn. Acad. iv. 174.—*O. Gallica*, Desm.—*O. brachyura*, Pallas, Spic. Zool.—*O. leptura*, Schreb. Saugth. t. 290 A. B.

a. HORNLESS SHEEP.

O. Anglicana, Linn. Amœn. Acad. iv. 174.—*Ovis A. Anglicus*, Erxleb.—*Lincolnshire Sheep*.

b. BLACK-FACED SHEEP (Fleming, Brit. Anim. 25).

Ovis collaris, Walker, Essays, 522.

c. MUGGS SHEEP and SHETLAND SHEEP (Fleming, Brit. Anim. 25.)

d. BARWALL SHEEP (Hodgson, Icon. ined. t.).

Inhabits central region, Nepal (*Hodgson*).

e. The CAGO or CAJIA BHIRA (Hodgson, Icon. ined. t.).

Inhabits Nepal, central region (*Hodgson*).

f. The HOONIA SHEEP.

Inhabits Nepal; Kachar only. Plains.

g. The SILENZIA SHEEP.

Inhabits Nepal; Kachar. Tame.

h. CURUMBAR SHEEP (Buchanan, Mysore, ii. 277. t. 17. f. 42, 43 ♂ ♀.)

Inhabits India; Mysore.

i. SHEEP OF BELKAH (Buckingham, Trav. Arab. Tribes, 93).

Inhabits Palestine; Plains of Belkah.

k. WEST INDIAN SHEEP (Blyth, Ann. N. H. vii. 255, note).

Inhabits West Indies. Mus. Zool. Soc.

l. BRASILIAN SHEEP (Gardiner, Trav. Brazils, 163).

3. SMOOTH-HAIRED SHEEP.

Ovis Africanus, Raii Syn. 75.—Linn. Amœn. Acad. vi. 173.—*O. Æthiopica*, Charlet. Exerc. 9.—*O. Africana*, Sloane, Jam. ii. 328.

a. AFRICAN SHEEP (Penn. Syn. 12).

Ovis Guineensis, Raii Syn. 75.—Linn. S. N. 98.—J. Geoff. Dict. Clas. H. N. xi. 268.—*O. A. longipes*, Desm. Mam. 489.—*A. Guineensis seu Angolensis*, Marg. Bras. 234, fig.—*Caper Mambrinus*, Charlet. Exerc. 10.—*Adimmayn*, Marmol. Afric. i. 39.—*Mouton*, Adans. Seneg. 37.—*Mouton à longues jambes*, F. Cuv. Mam. Lith. t. —*Bélier du Sénégal*, Buffon, H. N. xi. 359.—*Sheep of Sahara*, Shaw, Travels, 241.

b. GUINEA SHEEP (Knight, Mus. Anim. Nat. f. 676).

Bélier et Brebis des Indes, Buffon, H. N. xi. t. 35, 36.—Cop. *O. A. Guineensis*, Schreb. Saugth. t. 294, a, b, c.

c. MORVANT DE LA CHINE (Buffon, Supp. iii. t. 10).

d. SHAYMBLIAR SHEEP (Buchanan, Mysore, ii. 277. t. 18. f. 44, 45 ♂ ♀).

Inhabits India; Mysore.

e. SHEEP OF ZEYLA (Buckingham, Trav. Arab. Tribes, 93).

Inhabits Zeyla; entrance of Red Sea. Domestic at Mokha (*Buckingham*).

f. MOROCCO SHEEP. *Ovis Aries Numida* (H. Smith, G. A. K. iv. 326).

Inhabits Morocco.

g. CONGO SHEEP. *Ovis Aries Congensis* (H. Smith, G. A. K. iv. 326).

Inhabits Congo.

h. ANGOLA SHEEP. *Ovis Aries Angolensis* (H. Smith, G. A. K. iv. 326).

Inhabits Angola.

i. ZENU OR GOITERED SHEEP. *Ovis Aries Steatinion* (H. Smith, G. A. K. iv. 327. t. 196).

Inhabits Angola.

4. CRETAN SHEEP (Penn. Syn. 11. t. 3. f. 1.—Shaw, Zool. ii. t. 203).

Ovis Strepsiceros, Raii Syn. 75.—Linn. S. N. i. 98.—Belon Obs. 20, fig. —*O. A. Strepsiceros*, Schreb. Saugth. t. 291, a, b.—*O. Cretensis*, Johnst. Quad. t. 45.—*Capra Cretensis*, Brisson.—*Strepsiceros cretica*, Besch. Naturf. freund. iv. 624. t. 20.—*Cretensis Aries*, Aldrov. Bisulc. 406, fig.—*Strepsiceros*, Buffon, H. N. xi. 358.—*Bélier et Brebis de Valachie*, Buffon, H. N. Supp. iii. t. 7, 8.—*Yackl*, Austrians.

5. LONG-TAILED SHEEP.

Ovis Longicaudatus, Brisson, R. A. 76.—*O. dolichura stscherkessica*, Pallas, Spic. 60.—*O. arabica*, Johnst. Quad. t. 23.—*Arabia Oves*, Aldrov. Bisulc. 404.—*Arabisch Schaf*, Gesn. Thurb. 326, fig.—*Mouton à longue queue*, Munk. Palestine, t. 3.

6. BROAD-TAILED SHEEP (Shaw, Travels, 241.—Penn. Syn. 4. t. 1).

Ovis laticaudatus, Erxleb.—*O. laticauda platyceros s. arabica*, Linn. Amœn. Acad. iv. 173.—J. G. Gmelin, Nov. Com. Petrop. ii. 343. t. 8.—*O. Turcica*, Charlet. Exerc. 9.—*O. cauda obesa*, Ludolf, Æth. 146, fig.—*Arabia oves*, Aldrov. Bisulc. 404, fig.—*Mouton de Barbarie*, Buffon, H. N. xi. 355. t. 33.—*Sheep*, Russell, Aleppo, 51.—*Bélier de Tunis*, Ency. Méth. t. 47. f. 2.

a. FAT-RUMPED SHEEP (Shaw).

Ovis steatopygus, Pallas, Spic. 55. f. 4. f. 1, 2.—Schreb. Saugth. t. 292.—*O. Aries Kurgisii*, Gene, l. c.

b. PERSIAN SHEEP (Knight, Mus. Anim. Nat. f. 677).

Ovis Aries ecaudatus, J. Geoff. Dict. Class. H. N. xi. 268.—*O. A. recurvicauda*, Gene, Mem. Acad. Turino, xxxvii. 286. t. 1 & 2.

c. FAT-TAILED SHEEP (Knight, Mus. Anim. Nat. f. 678, 679).

Ovis Aries macrocerus, Schreb. Saugth. t. 295.—Gene, Mem. Acad. Torino, xxxvii. 285.—*Mouton à grosse queue*, F. Cuv. Mam. Lith. t.

d. BUCHARIAN SHEEP.

Ovis Bucharica, Pallas, Spic. xi. 78.—*Mouton d'Astrachan*, Desm.—*O. A. Astrachanica*, Gene, Mem. Acad. Torino, xxxvii.

The skin of the unborn lambs much prized as a fur.

e. THIBETAN SHEEP.

Ovis Thibetanus, Fischer, Syn. 491.—*Cachemerisches und Thibetanisches Schaf*, Walth.—*Tus Æssel*, Tibethian.

f. CAPE SHEEP (Penn. Syn. t. 462).

Ovis Capensis, Erxleb. 250.—Thunb. Mem. Acad. Petersb. iii. 318.

g. OVIS ARIES APPENDICULATA (Gene, Mem. Acad. Torino, xxxvii. 285).

h. INDIAN DOOMBA (Hodgson, Icon. ined.).

Inhabits Nepal; Tarai.

7. MANY-HORNED SHEEP (Penn. Syn. t. 3. f. 2, 3).

Ovis polyceratus, Linn. Amœn. Acad. iv. 174.—Schreb. Saugth. t. 289.—*O. sexicornis* and *O. tricornis*, Aldrov. Busalc. 397, fig.—*Brebis à plusieurs cornes*, Buffon, H. N. xi. 354.—*Bélier et Brebis d'Island*, Buffon, H. N. xi. t. 31, 32.—*Four-horned Ram*, Knight, Mus. Anim. Nat. f. 680.—*A. Cabul Doomba*, Hodgson, Icon. ined.

Inhabits Cabul.

Mr. Hodgson has published an interesting paper on the Domestic Sheep and Goats of India, in the 'Journal of the Asiatic Society of Calcutta' for October 1847.

The skin described as *Ixalus probaton* by Mr. Ogilby, and more fully described by Mr. Blyth (P. Z. S. 1840, 73), is most probably only a domestic variety of one of the short-haired domestic sheep.

2. PSEUDOIS (Hodgson).

Horns are smooth, subcylindrical, forming a fold; they are placed outwards at nearly right angles with the axis of the body, and recurved backwards at the tip; the body is covered with hair, and has a dark streak on the sides; neck is not maned; there is no tear-bag; the skull has no suborbital pit nor fissure; the interdigital pores are distinct; tail well developed, not tufted at the end.

The NERVATE or NAHOOR. *Pseudois Nahoor*.

Ovis Nahoor, Hodgson, Icon. ined. t. .—Blyth, Ann. N. H. vii. 200. t. 5. f. 6.—*Pseudois Nahoor*, Hodgson, J. A. S. Calcutta, 1846, 308.—*O. Ammon*, Rich, Faun. Amer. Bor. i. 274 (♂ Mus. Linn. Soc.).—*Armenian Argali*, Knight, Mus. A. Nat. f. 672?

Var. Smaller, darker; horn dark.

Ovis Burrhel, Blyth, Ann. N. H. vii. 248. t. 5. f. 7; P. Z. S. 1838, vi. 76 (♂ Mus. Linn. Soc.).—*Bural*, Hutton, Journ. Asiat. Soc. Beng. 1839, 994, 1840, 568; Bengal Sport. Mag. 1839, 295.—*Pseudois Burhal*, Hodgson, J. A. S. Calcutta, 1846, 308.

Inhabits Nepal and Great Thibet.

Female sometimes without horns.

3. AMNOTRAGUS (Blyth).

The forehead is concave; they have no tear-bag, nor any suborbital pit or fissure in the skull; the tail rather long, and tufted at the extremity; the horns are subcylindrical, turning outwards backwards, with the tips bent inwards towards each other; chin not bearded; neck maned beneath.

These animals never have any dark mark on the face or front of the limbs, like the Goats, and they bleat and butt; and the males are inodorous, like the True Sheep. Mr. Hodgson includes this genus with the *Nervate* or *Nahoor* in his genus *Pseudois*.

AOUDAD or KEBSH. *Amnotragus Tragelaphus*.

Yellow brown. Horns stout, turning outwards backwards, the tips bent inwards towards each other.

Ovis Tragelaphus, Desm. Mam. 480.—Blyth, Ann. N. H. vii. 258, 261.—*Ovis ornata*, Geoff. Egypt, t. .—J. Geoff. Dict. Class. H. N. xi. 264.—*Mouflon d'Afrique*, Cuv. R. A. i. 268.—*Capra Jaela*, Griffith, A. K. t. 192 (not text).—*Bearded Sheep*, Penn. Quad. 52. t. 9.—*Aoudad*, Jackson's Morocco.—*Fischthal* or *Lerwea*, Shaw, Trav. 243?—*Antilope Lervia*, Pallas, Spic. xii. 12?—*Aoudad* or *Kebsch*, Knight, Mus. Anim. Nat. f. 671.

Inhabits N. Africa. The *Aoudad* of the Moor, *Kebsch* of the Egyptians. Brit. Mus. An adult male.

THE MUSKS

ARE a small group of animals much allied to the Deer, but separated from them in never having any horns on the frontal bone, and in being furnished with very long, often exserted canines.

1. MOSCHUS (*Linn.*).

The MUSK-BEARING MUSK is covered with a very elastic fur formed of erect, spreading, closely-packed, elastic, tubular, waved, very brittle hair; a naked muffle, no tear-bag. They always have the hinder edge of their tarsus and the whole of their throat entirely covered with hair. The hoofs are small, compressed, narrow, triangular, acute; the false hoofs are elongate and well-developed. The tail is very short and rudimentary.

The males are provided, on the middle of the abdomen, with a large pouch secreting musk, and they have, on the outer side of the thigh, a celluliform and netted gland secreting a serous liquid.—*Brandt, Act. Acad. Imp. Petersb.* 1836.—*Ann. Anat. & Phys.* 1837, 283.

The young, like those of most deer, are spotted, and the adult generally plain-coloured.

The KUBARGA. *Moschus Sibiricus*.

Ash-brown; beneath paler; throat black or ashy, with a definite white streak on each side.

Animal Moschiferum Kubarga dicta, J. G. Gmelin, Nov. Com. Petrop. iv. 393.—*Moschus Sibiricus*, Pallas, Spic. Zool. xiii. 29. t. 4, 5, 6.—Gray, Cat. Mam. B. M. 172.—*Moschus Moschiferus*, Schreber, Saugth. 944. t. 242, 242a.—Shaw, Lever. Mus. i. t. 3?—Wrangel, Travels in Siberia.—*Moschus Moschiferus*, var. *Altaici*, Sundev.

Inhabits Siberia; Altai Mountains; Lake Baikal (*Gmelin*).

There is in the British Museum two skins of this species from the Altai, presented by the Royal Academy of St. Petersburg. Wrangel has observed the Siberian Musk on the borders of the Arctic Ocean.

The MUSK. *Moschus Moschiferus*.

Dark brown; chest and belly rather paler; throat and chest with indistinct pale cross bands.

Muskus, &c., Ysbrants Reize, 45. fig.—*Musk*, Buffon, Hist. Nat. xii. 361.—Supp. vi. 221. t. 29.—*Moschus Moschiferus*, Linn. S. N. i. 91.—*Animal Moschiferum*, Raii Quad. 124.—Calcol. Mus. 661. t. 666.—*Capreolus Moschus*, Gesner, Quad. 695.—Jonston, Quad. 55. t. 39.—*Capra Moschus*, Aldrov. Bisulc. 743.—*Moschus*, Schröckii Monag. 1667, 418.—*Capraea Moschifera*, Seger, Misc. Acad. Nat. Cur. i. 169. obs. 128. t. 11.—*Tragulus Moschiferus*, Klein.—*Tibet Musk*, Penn. Sys. 56. t. 10. f. 1; Quad. i. 112. t. 12. f. 1.—*Moschus saturatus*, Hodgson, J. Asiat. Soc. Beng. viii. 203. x. 795. t. xi. 285.—*Moschus Kacharensis*, Hodgson, Cat. MSS. v. t. 3.

Inhabits Thibet; Nepal.

The WHITE-BELLIED MUSK. *Moschus leucogaster*.

Dark brown; the throat, chest, belly, and the inside of the ears, pure white.

Moschus leucogaster, Hodgson, Journ. Asiat. Soc. Bengal, viii. 203. x. 914. xi. 285.—Gray, Cat. Mam. B. M. 172.—Cat. Hodgson's Collection in B. M. 31.—*Moschus niviventer*, Hodgson, Icon. ined. n. 188, 190, 193.

Inhabits Nepal.

We have a male and female specimen of this species in the British Museum, presented by Mr. Hodgson.

The GOLDEN-EYED MUSK. *Moschus chrysogaster*.

Grey brown; the ears, orbits, throat, chest, abdomen, and inner sides of the legs brilliant yellow.

Moschus chrysogaster, Hodgson, Journ. Asiat. Soc. Bengal, viii. 203. (1839) x. 914. xi. 285.—Gray, Cat. Mam. B. M. 172.—Cat. Hodgson's Collection in B. M. 31.—*Moschus moschiferus*, var. Sundeval.

Inhabits Nepal.

There are two specimens of this very distinct species in the British Museum Collection, which were presented by Mr. Hodgson.

The PYGMY MUSKS are covered with close-pressed hairs. The throat and the hinder edge of the tarsus is more or less naked. The canine teeth of the males are exerted. They are destitute of any musk and tear-bag, or brushes to the legs, are generally brown, with white streaks on the throat, and often spotted. The young are like the adult in colour.

This division contains three very distinct genera.

2. MEMINNA (Gray).

Chin covered with short adpressed hair; the legs are short and rather stout; the hinder edge of the metatarsus covered with hair; but on its outer side, a little below the hock, is a rather large, smooth, naked prominence (red when alive); intermaxillaries short, broad, edging the nasals. Fur striped and spotted.

The MEMINNA. *Meminna Indica*. TAB. XXXII.

Moschus Meminna, Erxleb. Syst. 322.—Schreb. Saugth. 960. t. 243.—*Chevrotain*, &c., Buffon, H. N. xiii. 315.—*Meminna ou Chevrotain de Ceylon*, Buffon, Supp. iii. 315.—*Meminna*, Knox, Ceylon, 21.—Shaw, Zool. ii. 256. t. —*Indian Musk*, Penn. Syn. 59. t. 10. f. 2; Quad. i. 127. t. 127.—Knight, Mus. Anim. Nat. f. 572, 574.—*Pissay*, Hamilton, Voy. E. Ind. i. 261.—*Mingee*, Tickel, Calcut. Journ. N. H. ii. 420.—*Tragulus Memina*, Sundev. Pecora, 63.—*Meminna Indica* and *M. Malaccensis*, Gray, Cat. Mam. B. M. 172.—*Tragulus mimenoides*, Hodgson, MSS.

Inhabits India; Madras, Ceylon.

3. HYEMOSCHUS (Gray).

Chin covered with short hair; the hinder edge of the metatarsus hairy, with a naked horny space beneath the hock; the intermaxillaries are elongate, oblong, truncated behind, and placed on the front end of the truncated maxilla, not reaching the nasals. Fur spotted like *Meminna*.

These animals have much the habit of Pigs. They take their food in the water. They are called *Deer Pigs* by the French colonists in W. Africa.

Dr. Hugh Falconer (Proc. Zool. Soc. 1843) gave some account of the osteology of the foot of this animal, and in his MSS. he informs me he has proposed to call the genus *Amphimoschus*. M. De Blainville has regarded it as the recent type of *Anoplotherium*. In the form of the feet it is very nearly allied to a fossil genus found in Auvergne, which M. A. Bravard has described under the name of *Cænotherium* (1835).

The BOOMORAH. *Hyemoschus aquaticus*. TAB. XXXI.

Brown; underside longitudinal streak on sides, and spots on back white.

Moschus aquaticus, Ogilby, P. Z. S. 1840, 35.—Falconer, P. G. S. 1843.—*Hyemoschus aquaticus*, Gray, Ann. and Mag. N. H. xvi. 350.—*Moschus Stanleyanus* (misprint for *aquaticus*), Sundev. Pecora, 64.—*Boomorah*, Negroes of Sierra Leone.—*Water Deer*, Colonists at Sierra Leone.—*Biche Cochon*, French colonists in W. Africa.

Inhabits W. Africa; Balham Creek. Sierra Leone.

This animal was first brought to this country by Mr. Whitfield, and Lord Derby has had several living at Knowsley. It is probably found in Senegal, as I discovered a specimen at a dealer's in Paris, which I presented to the Paris Museum, among some skins of Antelopes from that country. Though it has very much the external appearance of the *Meminna* from India, yet its skeleton presents several peculiarities, which render it necessary to form it into a separate genus.

Lord Derby observes:—

“My three remaining *Musks* go on very well, but I am puzzled at their name of *M. aquaticus*, as with us they seem to take no notice whatever of water.

“Here the people *doubt* its chewing the cud, and if so it cannot be a *Musk*.

“John tells me today he has seen them ruminant.”

4. TRAGULUS (*Brisson*).

Throat with a nakedish, concave, subglandular, callous disc between the branches of the lower jaw, from which a band extends to the fore-part of the chin; the hinder edge of the metatarsus nearly bald and slightly callous; fur soft, not spotted; the intermaxilla is short, subtriangular, extending up to the side of the nasal.

The STANLEY MUSK. *Moschus Stanleyanus*. TAB. XXXIII.

Reddish fulvous, hair black tipped; beneath white; neck and chest shining fulvous, with obscure white streaks; tail very short.

Moschus Stanleyanus, Gray, P. Z. S. 1836, 15 (not Sundev.).—*M. ecaudatus*, Temm. MSS. Mus. Leyden (1845).—Sundev. Pecora, 63.

Inhabits Ceylon.

This beautiful species lived some time in the Menagerie.

The NAPU OR JAVAN MUSK. *Tragulus Javanicus*. TAB. XXXV.

Pale brown, black grised; sides of head and rump shining fulvous; neck and nape ashy; throat with three white stripes; belly white; tail elongate.

Tragulus Javanicus, Pallas, Spic. Zool. xii. 18.—Gray, P. Z. S. 1836, 15; Cat. Mamm. Brit. Mus. 173.—*Moschus Javanicus*, Gmelin, S. N. i. 174.—Bennett, Zool. Gardens, 41.—Raffles, Linn. Trans. xiii. 261.—*M. Indicus*, Gmelin, S. N. i. 172.—Schreb. Saugth. 962. t. 245.—*M. Napu*, F. Cuv. Mam. Lith. t. —Fischer, Syn. Mam. 440.—*Tragulus Napu*, Sundev. Pecora, 63.

Inhabits Sumatra; Borneo; Java.

This species, so well described by Pallas, is easily known by its larger size and the ashy grised neck. The *Kanchil* has a yellow neck with a black nuchal streak.

The KANCHIL. *Tragulus Pygmeus*. TAB. XXXIV.

Fulvous, varied with black; side of neck and body paler, yellower; hair black tipped; streak along nape blackish.

Moschus pygmeus, Linn. S. N. i. 92.—*M. Kanchil*, Raffles, Linn. Trans. xiii. 262.—Fischer, Syn. Mam. 441.—*Chevrotaïn*, Buffon, H. N. xiii. 344; Supp. vi. 219. t. 30.—*Ch. de Java ou Kanchil (M. Javanicus)*, F. Cuv. Mam. Lith. t. ♂. t. ♀.—*M. Griffithsii*, Fischer, from Griffith, A. K. t. —*Javan Musk*, Shaw, Zool. ii. t. 173.—*Tragulus Kanchil*, Gray, P. Z. S. 1836; Cat. Mam. Brit. Mus. 176.—*Tr. affinis*, Gray, Cat. Mam. Brit. Mus. 176.—*Tr. pygmeus*, Sundev. Pecora, 63.

Var. Under surface pale fulvous, with four white streaks.

Chevrotaïn, Buffon, H. N. xii. 342. t. 42, 43.—*Moschus fulviventer*, Gray, P. Z. S. 1836, 65.—*Pelandoc*, Raffles, Linn. Trans. xiii. 262.—*M. Pelandoc*, H. Smith.

Inhabits Asiatic Islands; Java; Malacca; Penang.

THE OXEN,

As defined in the Preliminary Observations, have thick, heavy, roundish or depressed horns, which are situated on the frontal ridge, and bent laterally outwards and recurved at the tip. They have a broad nose, with the nostrils on the sides, and no tear-bag; the skull has no suborbital pit nor fissure; the cutting-teeth are nearly equal-sized, and slightly shelving outward; the fore-leg from knee (or wrist) short, much shorter than the upper joint of the fore-leg; this arises from the shortness of the cannon- compared with the fore-arm-bone.

The OXEN OF THE PLAINS of warm and temperate climates have a broad, moist, naked muffle at the end of the nose; they are covered with short, rigid, close-pressed hair or crisp woolly fur; their grinders have well-developed supplemental lobes; the bony part of the tail is produced, elongate, reaching to the hock.

The TRUE OXEN have their bodies covered with rather stiff hair; the shoulder proportionate with the haunches, and the cannon-bone of the hind and fore legs of equal length.

In some (as *Bos* and *Bubalis*) the intermaxillaries are elongate and produced behind between the nasal and cheek bones, and the upper lip is bald, callous and moist, as wide as the outer edge of the nostrils.

1. BOS.

Horns lateral, far apart at the base, placed upon the extremity of the ridge at the hinder end of the occipital plane; they are cylindrical conical, circular at the base, curved upwards and outwards; the face and frontal portion of the skull equal; dorsal ridge distinct, sometimes produced into a dorsal hump; the intermaxillaries are elongate, and reach to between the nasal and cheek bone.

The Ox. *Bos Taurus* (Linn.).

Forehead flat; withers not humped.

Bos Taurus, Linn. S. N. i. 98.—*Bos domesticus*, Jonston, Quad. 36. t. 14.—*Bos vel Taurus*, Plin. H. N. viii. 45.
—*Bœuf*, Buffon, H. N. iv. 437. t. 14.—*B. ordinaire*, Cuv. R. A. i. 269.

1. CHILLINGHAM BULL (Knight, Mus. Anim. Nat. f. 695, 696).

Inhabits Scotland. Brit. Mus.

2. ENGLISH SHORT-HORNED CATTLE (Knight, Mus. Anim. Nat. f. 701).

E. Domestic Cattle, Knight, Mus. Anim. Nat. f. 690-697.—*Yorkshire Cow*, Knight, Mus. Anim. Nat. f. 698.

3. POLISH OX.

Inhabits Poland. Brit. Mus.

4. HUNGARIAN OX.

Wild Cattle of Maremma, Knight, Mus. Anim. Nat. f. 703, 704.

Inhabits Hungary. Brit. Mus.

5. SOUTH AFRICAN LONG-HORNED CATTLE (Knight, Mus. Anim. Nat. f. 710).

Inhabits Cape of Good Hope.

6. SYRIAN OX (Knight, Mus. A. Nat. f. 726, 728).
7. MOLDAVIAN CATTLE (Knight, Mus. A. Nat. f. 709).
8. ITALIAN CAMPAGNA BULL (Knight, Mus. A. Nat. f. 705).
9. SPANISH BULLS (Knight, Mus. A. Nat. f. 706–708).
10. EGYPTIAN CATTLE (Long, Egyptian Antiquities in Brit. Mus. ii. 57. fig. 169, lower animals).

The ZEBU. *Bos Indicus*.

Forehead convex; withers with a more or less large fleshy hump; the dewlap deep, undulated; the upper part of rump very shelving.

Bos Indicus, Linn. S. N. 99.—*Bos minimus*, Frisch, Natur.—*Bos Taurus Indicus*, Fischer, Syn. Mam. 499.—*Little Indian Buffalo*, Edw. Birds, vi. t. 200.—*Indian Bull*, Penn. Syn. 6. t. 1. f. 2.—*Great Indian Ox*, Penn. Quad. 16. t. 1, lower figure.

Var. 1. “Horns project forwards and form a considerable angle with the forehead.”

Bos Taurus Indicus, Cuvier, Menag. Mus. t. ♀.

Inhabits South of India.

Var. 2. “Horns placed nearly on the same line as the forehead; prepuce large, often visible in the females.”

Zebu, Knight, Mus. A. Nat. f. 730–733.

Inhabits Bengal.

1. MADRAS OX (Buchanan, Mysore, ii. 8. t. 13. f. 34).
2. MADHU GIVI OXEN (Buchan. *l. c.* ii. 8. t. 13. f. 35, t. 14. f. 36, 37).
3. SERINGAPATAM OXEN (Buchan. *l. c.* ii. 8. t. 15. f. 38, 39).

Inhabits India; Mysore.

4. DOUBLE-HUMPED ZEBU.

Zebu à deux bosses, Desmarest, Mam.—*Bos Indicus Ditophus*, Fischer, Syn. 499.

5. HORNLESS ZEBU.

Zebu sans cornes, Cuvier, Menag. Mus. t. .—*Rindviech*, Pallas, N. Nord Beytr. iv. t. 3.

Inhabits Bucharía; from Arabia.

The DANTE. *Bos Dante*.

Face rather narrow; forehead very flat, with the horns on the side of the high occipital ridge; withers with a small but distinct hump.

Dante, Purchas, Pilgrim, ii. 1002.—*Bos Dante*, Link, Beytr. Nat. ii. 95.—Meyer, Zool. Arch. 1796, 188.—*Bos Bubalus Africanus*, Brisson, R. A. 79.—*Bos Taurus Africanus*, Fischer, Syn. Mam. 500.—*Salam Buffalo*, Whitfield.—*Dwarf Bull*, Penn. Syn. 9. t. 1. f. 1, 2, 3.—? *Egyptian Zebu*, Knight, Mus. Ann. Nat. f. 723, 724.—Long, Egypt. Antiq. Brit. Mus. ii. 57. f. 169, lower figures.

Inhabits Africa; West Africa, Salam (*Whitfield*).

Mr. Whitfield brought home a pair of the animals; the male (now in the Zoological Gardens, 1850) is white, with a few brown specks on the head; the female yellow brown; the head even narrower than that of the male. Purchas describes them as yellow.

The animal agrees better than the Zebras with the figures of the humped cattle on the Ancient Egyptian Tombs.—*Long's Egypt*, ii. 57. f. 169.

Hybrids of Domestic Cattle with Wild species.

Hybrid between a Xak Bull and a Zebu Cow.

HYBRID BULL (Mitchell, P. Z. S. 1847, 172. t. 15).

Tail elongate, bushy nearly to the base; withers highly crested; black, with a white spot on withers; in winter covered with long silky hair, in summer with shorter hair, having a crest of long hair on the dewlap and a tuft of elongated hair on the upper part of each leg.

This animal was imported as a *Xak*; it was for some time at the Gardens of the Zoological Society, but has been lately transferred to Knowsley.

Dr. Hoffmeister, in his Travels in Thibet, states that half-bred Xaks are common as domestic cattle for riding and ploughing.

Hybrid between the Zebu and Bibos frontalis.

JUNGLEY GAU. *Bos Sylhetanus*, F. Cuvier, Mam. Lithog. t. ♀.

Blackish; fore-legs white; face and withers brown.

Inhabits India.

2. BUBALUS (*H. Smith*, not *A. Smith*).

Horns depressed or trigonal at the base, rather in front of the occipital ridge, inclined outwards and backwards, conical and bending upwards at the tip; forehead rather transverse, convex, shelving before and behind; the intermaxillaries are elongated, and extend back so as to go between the nasal and cheek bones; teats four, in a cross series, the outer one rather before the others.

* *Horns separate, not dilated at the base, directed backwards and incurved at the tip.*

The ZAMOUS. *Bubalus Brachycerus*.

Forehead flat; horns short, thick, depressed at the base; ears very large, strongly fringed on the edge, and with two diverging fringed lines within; fur short, close, brown.

Bos Brachycerus, Gray, Ann. N. Hist. t. , young female.—Roulin, D'Orb. Dict. Univ. Hist. Nat. ii.—*Bos Bubalis*, Children, Clapperton's Voy.—*Bos Caffer*, var. Sundev.—*Bos caffer*, Ruppell, Abyss.

Inhabits W. Africa; Sierra Leone. Two heads, British Museum. Skeleton, British and Paris Mus.

The specimen of *Bos Caffer* from Abyssinia in the Frankfort Museum appears to be this species. The horns are 8 inches apart, and do not extend over the forehead; and the fur is pale brown, more abundant, and quite unlike the Cape specimens of *Bos Caffer* in the London and Paris Museums. In the Abyssinian skulls the intermaxillaries extend to the edge of the nasal, and are thin at the base.

The specimen of the female *Bos Brachycerus* which the Jardin des Plantes purchased of Cross, after I had described and figured it, died on the 24th of June, 1844. It was made into a skeleton, which is now in the Gallery of Anatomy at Paris. The metatarsus is 8 inches 6 lines long; the metacarpus 7 inches: and in *B. Americanus* the metatarsus is 6 inches 6 lines long; the metacarpus 7 inches: the bones of the latter are much more slender.

Mr. Whitfield, in 1846, brought with him from Gambia a female that had been presented by the King to the Governor of Gambia for the British Government, but it unfortunately died during a storm on its passage. The skeleton of this specimen is now in the British Museum Collection. This female was quite tractable and easily managed by men; but as soon as any fowl, sheep or cow came near, it immediately ran at them, and it is said to have killed two common cows while in confinement at Gambia. The old male, according to the account of Mr. Whitfield, has long hair on the front of the fore-legs, like the *Ovis Tragelaphus*.

Mr. Blyth has noticed two species of Wild Ox found in N.W. Africa:—

1. *Sherif al Wady* (*Bos Atlanticus*, Blyth), from Mount Atlas. One lived some months at Tangiers.

2. *Wadan*? or *Pecasse*? with a flowing nuchal mane, found in large herds at Rabat and Salee on the Barbary coast.—*Ann. N. H.* ix. 62. This is no doubt the *Bos Pegasus* (H. Smith, G. A. K. iv. 386. t. v. 890), the *Pegasus* (Plin. Hist. Nat. viii. 21), the *Wadan* (Lyon's Travels).

The BUFFALO. *Bubalus Buffelus*.

Forehead convex, rounded; horns large, flattened at the base, black, on the plane of the face, bent down and incurved at the tip; ears not quite half the length of the head, slightly ciliated; fur rough, irregular, bristly, often very far apart; of face, before the eyes, two-rowed.

Bos Bubalus, Brisson.—*B. Bubalis*, Linn.—*Bos Buffelus*, Blumenb.—*Bubalus Buffellus*, Gray.—*Bos Kerabau*, S. Müller, t. —*Buffle*, Buffon, xi. t. —F. Cuv. Mam. Lith. t. —*Buffalo*, Penn.

Var. 1. Horns very elongate, nearly straight, curved at the tip.

Bos Arnee, Shaw, Zool. ii. 400. t. 240.—*Arnee*, Knight, Mus. A. N. f. 747.

Var. 2. Body nearly naked.

Naked Buffalo, Penn. Syn. i. 8. t. 2. f. 1.

Inhabits India; Java. Domesticated in N. Africa and S. Europe. *Var. 2.* British Museum; young; from Zoological Society's Gardens.

** *Horns much enlarged and close together at the base, spreading out on side of the head and recurved at the tip.*

The CAPE BUFFALO. *Bubalus Caffer*.

Forehead broad; horns roundish at the end, depressed and very rugose, near the base becoming dilated and at length very broad, and close together on the forehead; ears very large, half as long as the head, broad, acute, ciliated; fur of face everywhere diverging (not two-rowed); skin bluish purple-black, nearly naked, with some longer hairs on the spine.

Bos Caffer, Sparm. K. S. Veten. Akad. 1779, t. 3.—Griffith, A. K. t. .—Harris, W. A. A. t. 13, and head.—*Cape Ox*, Penn.—*Cape Buffalo*, Knight, M. A. N. f. 751–753.—*Dwarf Ox*, Penn. Syn. i. 9. n. 7. t. 2. f. 3, young, horns.

Inhabits Africa; in the Desert. Cape of Good Hope. Zoological Gardens.

The horns of the young specimen are depressed and rugose, and very different from those of *B. Brachycerus*, which Prof. Sundeval considers as the young of this species. The pair of young horns which was in the museum of the Royal Society (Grew, Rar. 26), figured by Pennant (Syn. t. 2. f. 3), is now in the British Museum, and at once shows the distinctness of these two species.

3. ANOA (*Loten, H. Smith*).

Horns subtrigonal, round at the tip, depressed at the base and slightly keeled on the inner edge, straight, nearly on the plane of the face on the hinder edge of the frontal; the intermaxillaries elongate, high up between the maxillaries and the nasals; muffle narrowed below.

The ANOA. *Anoa depressicornis*. TAB. XXX.

Brownish red; spots on cheek white.

Anoa, Loten MSS.—Penn. Syn. 6.—Knight, M. A. N. f. 746.—*Bos Bubalis* β . *Anoa*, Meyer, Zool. Arch. 1796, 184.—*Antelope depressicornis*, Leach.—H. Smith, G. A. K. t. 181. f. 4, horns.—*Anoa compressicornis*, Leach.—*Ant. platyceros* and *A. Celebica*, Temm.—*Anoa depressicornis*, H. Smith.—Gray, Spic. Zool. t. 4. f. 2, 3.—Ann. Sci. Nat. iv. t. .

Inhabits Celebes. Mus. Knowsley. Male and Heads, Brit. Mus. Paris and Frankfort.

This animal was first noticed by Governor Loten; it was afterwards described by Colonel Hamilton Smith, from a head with horns in the Museum of the College of Surgeons. A similar head was received by General Hardwicke (which was given by him to the British Museum), accompanied by a sketch of the head and front part of the body of the animal, which is copied in my 'Spicilegia.' MM. Quoy and Gaimard afterwards published a figure of the animal, and took two male specimens with them to Paris, one of which is here figured, as it was sent to the Earl of Derby in exchange for some animals which he had sent to them.

Lord Derby thus writes in his Notes respecting it:—

"I have arranged our exchange for the *Anoa* and *Burchell's Zebra*. I propose to send them for the first an *Eland* adult, and for the latter a pair of *Alpaca*. I have also ventured to ask if I might borrow their male *Sing-Sing* to cross with my two females, giving them a share of the produce of course."—Nov. 6, 1845.

"I like the *Anoa* much as a curiosity, but it is certainly horrid ugly, though I will make Hawkins draw it, as I know no figure from the life."—Jan. 3, 1846.

"Hawkins has drawn the *Anoa*, and I think with success, except that the hair below the throat and neck seems to me to be too long, and to give the idea of a sort of mane. J. Thompson thinks the neck has been made too thick; but that can hardly be, as the animal is of a very heavy make there as well as elsewhere.

"You will be sorry to hear that we have lost the *Anoa* from Paris. It was ill for a short time, owing, we suspect, to the changes of the weather, and died at last of general inflammation. It has been ordered up to my own museum; and I regret it, not on account of its beauty, but its rarity, and the source it came from to me."—Feb. 15, 1846.

The GAYALS have the intermaxillaries short, triangular, not reaching to the edge of the nasal bone; the upper lip is bald, callous and moist, only as wide as the inner edge of the nostrils.

4. BIBOS (*Hodgson*).

Horns depressed at the base, directed outwards, posterior, on the hinder ridge of the frontal bone, which is often very prominent, recurved at the tip; withers high, keeled, supported by the spinous processes of the dorsal vertebra, and suddenly lower behind; the intermaxillaries are short and triangular, and do not reach to the nasals. Brown or black (adult males); legs beneath the knees (and sometimes the rump) white; the baldness of the upper lip converging beneath from the inner edge of the nostrils.

* *Forehead flat; horns broad, depressed, black; front half of back with long prominence.* Probos (*Hodgson*).

The GAYAL. *Bibos frontalis*.

Black; lips, forehead and legs grey; inside of ears white; horns depressed, broad at the base, conical, black; forehead flat, very broad.

“*Bos guavera*, Penn.,” Buchan. Icon. ined. t. 7.—*Bos frontalis*, Lambert, Linn. Trans. vii. t. 4, young (1812).—*Bos bubalis* v. *guavera*, Meyer, Zool. Arch. (1796) 184.—*Gayal*, Colebrooke, Asiat. Res. vii. 511.—Hardw. Zool. Journ. iii. 233. t. 7. f. 1.—Knight, Mus. Anim. Nat. f. 743, 741 and 742?—*Bos Gaveus*, H. Smith, G. A. K.—*Bos Sylhetanus*, F. Cuv. Mam. Lith. t. ♂. t. ♀ (hybrid).—Knight, Mus. Anim. Nat. f. 744.

Inhabits India; Chittagong. Skulls, B. M.

Dr. Buchanan’s figure, in the India House Library, was the first, and is the best yet given of this species. The *Jungly Gau*, figured by M. F. Cuvier, is from a tracing made by M. Duvaucel from a drawing of General Hardwicke, taken from a specimen bred between a domestic *Gayal* and a *Zebu*; it has a larger, deeper, and more waved dewlap than the wild specimen, and differently shaped horns.

There was a specimen of this species, recently alive, in the Zoological Gardens, which was sold in Calcutta, when young, for the calf of a common Bull.

** *Forehead concave; horns pale, rather depressed at the base. Back with a prominence over shoulder and over middle of back.*

The GAUR. *Bibos Gaurus*.

Bos Gaurus (*Gaur*), H. Smith, G. A. K. v. 373.—*Bos cavifrons*, Hodgson, Elliot, Madras Journ. 1840, t. ♂, good.—*Bos Gour*, Trail.—Hardw. Zool. Journ. iii. 232. t. 7. f. 2.—*Bos aculeatus*, Schinz.—*Gaour*, Geoff.—*Gaur*, Johnston.—*Gour*, Knight, Mus. Anim. Nat. f. 746.

Inhabits India; Mountain district, Nepaul; Neilgherries. Male in British Museum.

The male is called *Gour*, and the young *Purarah*; the female *Gourin*, and the young *Purreah*.

The BANTING. *Bibos Banting*.

Black; rump and legs white. Calf pale brown, with a dorsal streak, widest behind; tip of tail black; rump and legs like back, not white as in adult.

Bos Banting, Raffles.—*Bos leucoprymnos*, Quoy & Gaim.—*Bos Bantiger*, Temm.—*Bos Sondaicus*, S. Müller, t. 35-39, animal and skull.

Inhabits Java, Borneo and Bali. Stuffed skin and skeleton of each sex in the British Museum.

The BISOONS are covered with short crisp wool; their shoulders are higher than their haunches, and the cannon-bone of the hind-leg is longer than the fore; they have fourteen or fifteen pairs of ribs. The intermaxillaries are very short, triangular, and do not reach nearly to the nasal bones; the horns are round, placed in front of the occipital ridge, directed outwards, and then bent upwards.

5. BISON (*H. Smith*).

Muffle short, scarcely reaching to the hinder edge of the nostrils; horns rather depressed at the base, lateral, coming out before the ridge of the occiput, curved upwards and outwards, the frontal broader than long, convex; dorsal ridge rather high and gradually lower behind; head, crown, and shoulders with long curled hair; the baldness of the upper lip square, as wide as the space between the inner edge of the nostrils; dewlap none; teats four, in a square.

The BISON. *Bison Bonassus*.

The hind-legs feathered; the hinder quarters nearly proportionate; chin and throat with a dependent mane of elongate hair.

Bos Bonassus, Linn. S. N.—*B. Urus*, Bodd.—Pallas, Zool. Ross. Asiat. i. 242.—Bojanus, N. A. N. C. xiii. 414.

t. 20, 28.—Eichwald, Zool. Special. iii. t. 1.—*B. Taurus Urus*, Gmelin, i. 202.—*B. Bonasus*, Linn. S. N. i. 99.—*Bos Bison*, H. Smith.—Nilsson.—Wagner.—Sundev.—Baer.—*Bonasus and Jubatus Bison*, Plin.—*Urus jubatus*, Jonston.—*Bison*, Aldrov.—*Aurochs*, Buffon.—Cuvier, Oss. Foss. iv. t. 9. f. 1, 2. t. 10. f. 1, 2. t. 12. f. 6, 7.

Inhabits N. of Europe; Lithuania, Poland, and Caucasus. Adult male and young female. Formerly in Sweden.

A finely stuffed male, and the skeleton of a male, in the British Museum. Presented to that Institution by the Emperor of all the Russias, who also presented a pair of young specimens to the Zoological Society.

They are not nearly so low on the hind quarter as the *American Bison*; the carpi and tarsi being more elongated than in that species, and of nearly equal length; so that they more resemble the typical Oxen in form: but what strikes one as the greatest peculiarity of their appearance is, that both sexes have a compressed mane of long soft hair hanging from the under side of the chin and throat to the front of the chest, forming a fringe of from four to eight inches in length.

The tarsi of these specimens, which are seventeen months old, are much longer and not so thin as those of the adult *American Bison* in the Gardens.

THE AMERICAN BISON OR AMERICAN BUFFALO. *Bison Americanus*.

The hind-legs not feathered; the hind-quarters very low; the head, neck, and front of the body covered with thick, elongated, crisp, woolly hair.

Bos Americanus, Gmelin.—*B. Bison*, Linn.—*Buffalo*, Catesby, Carol. t. 20.—*Bison*, Buffon, H. N. Supp. iii. t. 5; Mam. Lith. t. —Cuv. Oss. Foss. iv. t. 10. f. 3, 6.—*American Bison*, Knight, M. A. N. f. 759–762.

Young Calf, pale reddish brown.

Inhabits N. America.

A well-preserved male, shot by Mr. Audubon on the banks of the Yellow River, and stuffed in America, in the British Museum Collection.

The Earl of Derby has a herd of this species. In his Notes he observes:—

“Did I tell you that the *Bison* had calved?”

“I do not know what the calf is; I hope a female.”

“The young *Bison* is a female, and very odd-looking I am told; of a yellowish colour. I have not yet seen it.”

“Miss *Bison* progresses vastly well.”—June 1846.

“My female *Bison* is I hope about to be again put in the way of producing.”—July 2, 1846.

“We have had an alarm about the *Bison*, who has got out of his paddock and into the open park, having fairly swum over the great water. Very luckily he has been got back again without any mischief being done.”—July 7, 1846.

II. The OXEN OF THE MOUNTAINS and SNOWY REGIONS, on the contrary, have an ovine nose, entirely covered with hair, or with only a small naked space between the nostrils, and a shorter tail. They are generally covered during the cold season with long pendent hair, and have a horse-like switch tail, but the bony part of the tail is less developed than in Oxen of the Plains. The nostrils are rather close together below.

6. POËPHAGUS (*Gray*).

The nose hairy, with a narrow, central, naked muffle; the horns are subcylindrical, far apart, lateral, and placed, like the *Bisons*, in front of the occipital ridge; the hoofs are moderate, thick, not dilated or expanded, as in the *Musk Ox*; they are square and straight in front; the intermaxillaries are short, triangular, and acute behind, and do not reach to the nasal bones; bone of the tail produced, covered with long hair; teats four, narrowing behind; perineum, scrotum, and inside of thigh and arm-pits naked. Mountains of Asia.

These animals have many characters in common with the *Bisons*, as observed by Mr. Hodgson, but are separated by the hairy muffle, elongate fur, and switch tail.

THE YAC OR SARLUK. *Poëphagus grunniens*.

Black, or black and white varied.

Bos grunniens, Linn. S. N. 99.—*Vacca grunniens*, Gmelin, N. Com. Petrop. v. t. 7.—*Bos poëphagus*, Pallas, Zool. Ross. Asiat. 249; Nov. Act. Petrop. i. 2. 332; Nord Beytr. i. 1. t. 1.—H. Smith.—*Bœuf velu*,

Bruyn. It. Mosc. 120. t. 129.—*Tangutischen Büffel*, Pallas, Nord Beytr. i. t. 1 (1780), (muffle too large).
 —*Buffelart mid dem Pferde schweif*, Gmelin, Nov. Com. Petrop. v. 339. t. 7.—*Yac*, Turner, 186. t. 10.—
 Shaw, Zool. ii. 411. t. 213.—*Bubul*, Bell, Travels, i. 212.—*The Grunting Bull*, Penn. Syn. 5.—Cuvier,
 Oss. Foss. iv. t. 10. f. 13, 14, skull.—*Yac* or *Svora*, Soy, Asiat. Res. iv. 349. t.

Inhabits Thibet.

A specimen in the British Museum, and another in the India House Museum.

In the Gardens of the Zoological Society there is a *hybrid* between this animal and a domestic Indian Ox. It is figured in the Illustrated Proceedings of the Society for 1850.

7. OVIBOS (*Blainv.*).

Nose ovine; muffle none; horns very broad at the base, nearly united together, tapering, pressed downwards against the sides of the head, and bent up at the tips; tail very short, covered with elongate hair; hoofs broad, apices inflexed; the intermaxillaries?; the skull has a small depression in front of the orbit, but no fissure; the grinders are without supplemental lobes; the bones of the tail very short, not produced beyond the edge of the pelvis.

Inhabits N. America.

The skull has many characters which show its relation to the Sheep.

The MUSK Ox. *Ovibos moschatus*.

Bos moschatus, Zimmerm.—Herm. Naturf. xix. t. 5.—*Musk Ox*, Dobbs, Hudson's Bay, 1825.—Penn. Art. Zool. 269, fig.—Parry, Voy. t. —Knight, M. A. N. f. 767.—Buffon, Supp. vi. t. 3, head.—Cuvier, Oss. Foss. iv. t. 10. f. 15, 17, skull.—*American Ox*, Penn. Syn. i. 8. t. 2. f. 2, good; cop. E. M. t. . f. —*Bisamoschse*, Herm. Beitr. Naturf. xix. 9. t. 5, head.—*Ovibos moschatus*, Blainv.—Desm. Mamm. 492.—*Bœuf Musque*, Charlev. N. Tr. iii. 131.

Inhabits N. America. Brit. Mus.

A beautifully preserved male, in the collection of the British Museum, which was brought to this country by the Arctic Expedition, and presented by the Admiralty. This is the only example known to exist in any museum in Europe or America. It has served for the type of all the figures, from Parry to Audubon.

The bones of this species are found with those of the Mammoth at Eschscholz Bay, Behring's Straits.—See *Pallas*, Nov. Comm. xvii. t. 17; *Cuvier*, Oss. Foss. iv. 150. t. 3. f. 3, 8. t. 11. f. 1–4; *Siebel*, Fauna, i. 155.

8. BUDORCAS (*Hodgson*).

Muzzle hairy, with a small naked muffle only edging the nostrils; ears narrow, pointed; the fur (in summer at least) consists of short, harsh, adpressed hair; the tail is short, very depressed, and hairy, like the tail of a Goat; the head is large and heavy; the lips taper, and are clad with hair, like Sheep; the nostrils are wide and terminal; the horns are round, smooth, lunate; they are nearly in contact on the top of the head; their direction is vertically upwards, then horizontally outwards or to the sides, and then almost as horizontally backwards; the limbs short and straight; the hoofs broad.

Inhabits Mountains of Asia.

This very interesting genus is only known to me from Mr. Hodgson's description and figures, and its place in the system is doubtful; but it appears to be more related to the Mountain Oxen than to any other groups, though covered with adpressed hair. It has a mane on the throat.

The TAKIN. *Budorcas taxicola*.

Yellowish grey; hairs yellow, black tipped; the head, neck, dorsal streak, belly, limbs and tail black; they are sometimes entirely black.

Budorcas taxicola (*Takin*), Hodgson, Journ. Asiat. Soc. Bengal, 1850, 65. t. 1, 2, 3, animal and skull.

Inhabits Eastern Himalaya; the Mishmi Mountains. Called *Takin* by the Mishmis, and *Kin* by the Khamtis.

THE CAMELS AND LLAMA.

THE CAMELS are at once distinguished from the other Ruminants by having two cutting teeth in the upper jaw and only six in the lower, and by the peculiar form of their feet, which consist of two elongated toes which are callous beneath, and each armed at the end with a small, more or less claw-like hoof; they are destitute of any lateral rudimentary toes or false hoofs; have a produced nose, with dependent upper lips, nicked in front, and are without any horns or lacrymatory sinus; their ears are oblong, moderate; their neck long; they have canine teeth in both jaws; their thighs are free from the body, like those of men and apes, which give them a very peculiar appearance. They rest with their feet folded under them, and with their chest on the earth; hence their knees and chest are generally callous.

The CAMELS of the Old World have a short, tufted tail; one or two humps on the back; their anterior grinders are conical, and far apart, like the canines. They have six grinders on each side in the upper and five in the lower jaw. The toes are broad, with nearly orbicular soles, and are only slightly separated from each other in front.

1. CAMELUS (*Linn.*).

Living on leaves, and peculiar to the temperate and warmer parts of Asia and Africa.

The SGHIMEL OR DROMEDARY. *Camelus Arabicus* (*Linn.*).

Back with one hump.

Camelus Dromedarius, Linn. S. N.—*C. Dromas*, Gesner.—Pallas.—*C. Arabiae*, Plin.—*C. Arabicus*, Aristotle.—Desmoul.—Sundeval, Pecora, 104.—*C. Bactrianus*, Aldrov.—*C. vulgaris*, Forsk.—*C. Monolophus*, Walther.—*Chameau*, Perrault, Anim. i. 69. t. 7.—Buffon, H. N. xi. t. 9.—*Camel*, Penn. Quad. t. —*Dromedaire blanche*, F. Cuv. Mam. Lith. t. ♂. t. jun.—Cuvier, Menag. Mus. t. —*Le Dromedaire brun*, F. Cuv. Mam. Lith. t. ♂.

Var. 1. Camel. (*Gimel* or *Jemal* of the Arabs), stronger and slower.

Var. 2. Dromedary. (*Hadjin* of the Arabs), slighter and fleet.

Var. 3. Stronger. *C. Luk*, Eversmann, Bucharia.

Inhabits deserts of Arabia. Domesticated in Senegal and India. Specimen and skeleton in British Museum.

The MECHERI OR BACTRIAN CAMEL. *Camelus Bactrianus*.

Brown; neck, humps and limbs with longer hair; back with two humps.

C. Bactrianus, Linn. S. N.—*Camelus ditophus*, Walther.—*C. Bactriae*, Plin.—*C. Turcicus*, Alpinus.—*Chameau*, Buffon, H. N. xi. 211, 426. t. 22.—Cuvier, Menag. Mus. t. —F. Cuvier, Mam. Lith. t. ♂.—*Bactrian Camel*, Penn.

Inhabits Mongolian Deserts. Domesticated in Eastern Europe, Persia, Tartary, and India. Skeleton in British Museum.

The LAMAS of the Western or New World have no humps on the back; the tail is short and hairy; the toes are slender, separate in front, so that the soles are half-divided. They have only five grinders on each side of the upper and four on the lower jaw. They are confined to the western side of South America.

2. LAMA (Cuvier), AUCHENIA (Illiger), LACMA (Tiedem.).

Molina, and most systematic writers after him, consider that there are five distinct kinds, viz. 1. *Vicogna*, 2. *Chililhueque*, 3. *Guanaco*, 4. *Alpaca*, and 5. *Ghama*.

M. F. Cuvier only allows of three kinds; he considers the *Vigogne* as very doubtful, but the latter is often brought alive to this country.

Dr. Tschudi, in the 'Fauna of Peru,' allows of four kinds, viz. 1. *A. Huanaco*, 2. *A. Lama*, 3. *A. Pacos*, and 4. *A. Vicunia*, t. 17; he states that the *Lama* and *Alpaca* are only known in the domesticated state.

Dr. Sundeval considers there is only two species, the *A. Lama* and *A. Vicunna*, regarding the *Lama* and *Alpaca* as domestic varieties of the *Huanaco*.

The WILD kinds are of a nearly uniform brown colour.

1. The VICUGNA. *Lama Vicugna*.

Reddish brown; belly white; outside of limbs paler; hair moderate, of the front of the thighs and especially of the chest elongate and pendent; the legs without any hard horny warts; claws triangular; face short; forehead swollen, rounded; ears elongate.

Camelus Vicugna, Molina, Chili, 277.—Gmelin.—*Auchenia Vicugna*, Desm.—*A. Vicunna*, Sundeval, Pecora, 107.—*Lacma Vicunna*, Tiedem.—Fischer, Syn. Mam.—*Auchenia Vicunia*, Tschudi, Wieg. Arch. 1824, 245; Fauna Peruv. t. 17.—*Vicunna*, Laet. Nov. Orb. 406.—Nieremb. H. N. 184. f. 185.—Ulloa, Voy. i. 306. t. 24. f. 3.—*Vicogna*, Buffon, H. N. vi. 208. t. 34.—*Vicognes ou Vicunas*, Frezier's Voy. i. 266.

Inhabits Peruvian Alps. Confined to the most elevated table-land and mountains of Bolivia and North Chili.

2. The GUANACO. *Lama Huanaca*.

Brown; hair woolly, very dense, nearly of a uniform length; the legs with distinct, hard, horny warts; ears half as long as the head; face rather elongate; chest callous.

Camelus Guanaco, Trail, Wern. Trans. iv. 492. t. .—*C. Huanacus*, Molina.—*Lama Peruana* α , Fischer, Syn. 456.—*Auchenia Lama fera*, Sundeval, Pecora, 107.—*Camelus glama*, Linn.—*Auchenia glama*, var. Bennett, Gard. Zool. Soc. 273, fig.—*Auchenia lama*, Brandt.—Wagner.—*Auchenia Huanaco*, Tschudi, Fauna Peruv.—*Guanano sive Huanacu*, Laet, Nov. Orb. 1633, 406.—Ovalli, Chili, 44.—Ulloa, Voy. i. 36. t. 24. f. 5.

Inhabits Peruvian Alps; the Pampas and mountains in Chili, Mendoza, and Straits of Magellan.

The DOMESTICATED KIND are of various colours, and the same specimens are often variegated of different colours. Almost all the persons who have lived in the countries inhabited by them consider that they are distinct species from the two wild species already described, and that there are at least two, and some will persist more, species of the domesticated kinds, and will not allow that they are like the long-legged sheep of France and the short-legged sheep of Lincolnshire, mere breeds of the same kinds; some, as Tschudi (Fauna Peruana), declare that they will not breed together nor with the wild kinds, but Lord Derby's experience shows that this is not the case.

The LLAMA, or YAMMA. *Lama Glama*.

Fur brown or variegated; hair on the forehead and cheeks like that of the rest of the head; legs elongate, slender.

Camelus Glama, Linn.—Cuvier, Menag. Mus. t. .—F. Cuv. Mam. Lith. t. .—*Auchenia Glama*, Desm.—*C. Peruanus*, Brisson.—*L. Peruana* β . *domestica*, Fischer.—*Lacma Peruana*, Tiedem.—*Ovis Peruana*, Hernandez. Mex. 660, fig.—? *Camelus Araucanus*, Molina.—*Lama Arucana*, Fischer.—*Auchenia Lama* β . *domestica*, Sundeval, Pecora, 107.—*Llama*, Ulloa, Voy. i. 365. t. 24. f. 5.—Laet, Nov. Orb. 1633, 405.—Penn.—*Lama*, Buffon, H. N. xiii. 16; Supp. vi. 204. t. 17.—F. Cuv. Mam. Lith. t. .—*Auchenia Lama*, Tschudi, Fauna Peru.—? *Chililhueque*, Shaw, Zool. ii. 418.—*Camelus Llacma*, F. Cuv. Mam. Lith. t.

Inhabits Peruvian Alps.

These animals were first noticed under the name *Elaphocamelus* by Matthiola (Episc. 1561, 381, fig., and 1564, p. 630, fig.). These figures were repeated in Marcg. Braz. 243 and Marcg. Chili, 38, and by Jonston (Quad. t. 46), under the name *Ovis Peruana*. Hernandez (Mex. 660) gives a bad figure under the name of *Ovis Peruana*. Jonston gives another figure of them under the name of *Cervocamelus*. Laet (Novus Orbis, 1633) speaks of the *Llama* (p. 405), the *Guanaco* sive *Huanacu* (p. 406); and Ulloa (Voy. 1752, i. 366. t. 24. f. 5) calls them by the same names.

The ALPACA. *Lama Pacos*.

Black, or black and white, or brown varied; forehead and cheeks with elongated hair; body large; sides with long, pendulous hair; legs short; belly and inside of legs nakedish.

Camelus Pacos, Linn.—*Lama Pacos*, Lesson.—*Auchenia Alpaca*, Desm.—*Auchenia Glama*, var. (*Llama*), Bennett, Gard. Zool. Soc. 283. fig.—*Alpaque*, Frezier, Voy. i. 267.—*Pacos*, Hernand. Mex. 663.—*Paco*, Laet, Amer. 405.—*Auchenia Lama v. domestica* (Sundev. Pecora).—Buffon, H. N. xiii. 16.—*Alpaca*, F. Cuv. Mam. Lith. t. —*Auchenia Paco*, Tschudi, Fauna Peru.

Inhabits Peru.

M. F. Cuvier, under this name, figures a paler brown, short-legged animal, probably a half-breed *Llama*, which was destitute of any tubercles on the chest, wrist and knee. I have never seen any specimens which exactly agreed with his figure, or wanting the tubercles. G. Fischer, from F. Cuvier, gives the want of these tubercles as the character of the species.

The EARL OF DERBY sent me the following note on these animals :—

“ I shall be able, in about ten days, to send you some account of the breeding of the *Llama* tribe here. The sort of which we can tell you least is the *Vicunha*, which have never bred, having never obtained but one female and no male. As they are very docile and gentle, I doubt not we should have bred them could I have got both sexes, but I do not think *they* would cross with the others. I believe it is generally allowed that the *Llama* and *Alpaca* will breed together, and I know that the other two will, because my female *Guanaco*, which, though put with her own male, never produced (I believe the fault was on his side), nor, as far as we knew, ever copulated, bred at once when put with a male *Llama*, and produced a female; but that produce has never bred *as yet* (she is only one year old), nor has the mother again. Indeed I did not think that it would be any object to continue the trial any further; but if you think otherwise, we can easily try it again.

“ I intend to try to produce the *Tityrus Musimon*, according to the quaint distich given in Griffith’s translation of Cuvier (iv. 311), viz. :—

‘ Tityrus ex ovibus oritur, hircoque parente :
Musimonem Capra ex vervegno semine gignit —.’

“ Specimens of the four kinds of this tribe of animals, namely the *Llama*, *Alpaca*, *Guanaco*, and *Vicuna*, have for several years been kept in life at Knowsley; but of the *Vicuna*, which is the rarest of the tribe, only one specimen existed here, which unfortunately came to an untimely end in 1844, thus breaking this complete series of these interesting quadrupeds. Of the four kinds the *Alpaca* is the most important, as bearing the wool now so extensively used for articles of dress; on which account numerous attempts have been made to naturalize the species in Great Britain, which its reputed hardihood seemed to point out as an easy achievement, but which attempts have not hitherto been attended with much success. The length of the voyage, added to unskilful treatment, so much impairs the health of those that survive, that they seldom live for any length of time after their arrival; otherwise they could, with judicious treatment, in all probability be naturalized, and after a few generations would, as in the case of some other exotics, become perfectly inured to our climate.

“ The four kinds are perfectly distinct, yet have such a general resemblance, that one kind may easily be mistaken for another: the distinctions however are very evident to a practised eye, and are as follows :—

“ The *Guanaco* approaches the *Llama* very nearly, both in its size and in the texture of its wool, but is a much stronger and more vigorous animal. It is clean and well-made, light and active, and always of a light buff or fawn colour on the upper surface, and white beneath and on the inner side of the limbs; the face is greyish black. There is less wool on the head, neck and upper part of the limbs, and that on the body is shorter and more sparingly furnished than in the *Llama*, and is mixed with coarse hair of greater length than the wool. The male is vicious, active, watchful and restless, and nearly or quite untameable; this is the invariable character of the species. In confinement it is constantly trying to seize any person that approaches it; it endeavours to throw down its opponent by springing against him with all its force, and then bites viciously. The spirit of the *adult* animal is such, that it will never allow itself to be conquered otherwise than by sheer strength. The female, though milder and of more quiet habits, is of a fiery disposition, and ready to avenge any affront.

“ The *Vicuna* is the smallest of the four kinds, measuring 2 feet 10 inches high at the withers. The neck is long, the ears moderately so. The wool is shortest on the neck and limbs; on the body it is 3 inches in

length; and along the lower part of the sides numerous hairs of double that length are intermixed with the wool, and wave lightly over the under covering, to which they form a sort of fringe. The colour is always buff or fawn-colour, and, as in the *Guanaco*, never varies. The *Vicuna* is a very timid animal, always wandering to the furthest limit of its inclosure, seeking further liberty; it is very nimble, light and active, fond of solitude, and perfectly harmless. The wool is of the finest possible texture, greatly surpassing even that of the *Alpaca*, and has lately been used as a substitute for the fur of the Beaver.

"The *Llama* is the largest and strongest built of the four kinds, standing about 3 feet 9 inches high at the shoulder. The colour varies so considerably in different individuals, that the five living examples now at Knowsley are *each* of a different colour; but the variations, though so great, are generally merely variations of one colour, *brown*; in some specimens there is more or less of pure white on different parts of the animal. The wool is coarse, unfit for finer fabrics, and seldom more than 12 inches long; it covers the lower part of the neck and the whole of the body, leaving the head and legs clothed with only a short fur. The ears are longer in proportion than those of the *Alpaca*, and rather more curved towards each other. Its temper is always mild and gentle.

"The *Alpaca* is much smaller than the *Llama*, and more slenderly built; standing about 3 feet 2 inches high at the shoulder. The colour varies, but not so much as in the *Llamas*: some are pure white, with one or two black patches; some are entirely black; while others are dark brown; but black is the predominant colour. The wool is thick-set and extremely fine and soft, and covers the whole head, neck, body and legs, leaving only the face bare. The wool reaches in some instances to 17 inches in length, and sometimes exceeds even that, which is perhaps rather more than the average, which is attained in about two years after shearing. The full-fleeced *Alpaca* is so thickly clothed with wool from head to foot, that he may at once be known from the rest of the group; his long neck appears of great bulk from the quantity of its clothing; indeed, no animal could be provided with a warmer dress, which in some cases almost touches the ground. The *Alpaca* is perfectly harmless and inoffensive.

"The period of gestation in the three kinds which have bred at Knowsley, namely the *Llama*, *Alpaca*, and *Guanaco*, is eleven months. The *Llama* and *Alpaca* breed regularly, but by the *Guanaco* only a single fawn has been produced, to which one of the male *Llamas* is sire. None of them produce more than one at a birth.

"All the tribe have the disagreeable habit of spitting, when irritated, a quantity of half-digested cud; the *Llama* and *Alpaca* do this only when much annoyed; the *Guanaco*, on the contrary, upon the slightest occasion.

"Unlike Sheep, these animals never shed their coat.

"Two other species of South American quadrupeds, the *Chilihueque* and the *Taruga*, are referred to this tribe, but very little is known respecting them.

"Though the *Llama*, *Alpaca* and *Vicuna* are perfectly harmless and inoffensive, yet, as may be supposed, the males will very readily quarrel with *each other*.

"Mr. Walton, a zealous advocate for the naturalization of the *Alpaca*, in his little book on the subject published by Blackwood in 1844, apprehends better success will be the result when the *Alpacas* are turned on to waste and mountain lands, than when they are kept on richer pasture and well cared for. But the fact that few, if any, specimens are now living in Great Britain beside those at Knowsley, does not favour this conclusion."

"I do not know if I told you, that, finding my pair of *Huanacos* did not make any attempt to breed, I put the female to a male *Llama*, and we have this year a female hybrid doing well. You, I believe, will say this is no hybrid, but only the offspring of two varieties of the same stock; but here we think the four kinds, *Llama*, *Guanaco*, *Alpaca*, and *Vicuna*, are perfectly separate and distinct, if not species at least as races; but I am inclined to say the former. I am inclined to separate all the four, though they will mostly breed together, and I believe, but am not sure, that the produce is prolific also. I cannot point out any distinction of form, and I do not rely on colour, unless it is constant; but habit of temper and disposition I look on as being more legitimate characteristics."—Jan. 22, 1844.

"A young *Guanaco*, but this last is hybrid with the *Llama*."

"I have also lost my only *Vicuna*, a female, and I am afraid by some impropriety, but which we cannot yet detect."

"We have bred this year three *Alpaca* and one *Llama*; the first are two females and one male: we expect more of both: and lastly, the *Guanaco* crossed with the *Llama*."—May 19, 1845.

M. Desmoulin, on the authority of the Abbé Beliard, gives an account of the attempt to introduce thirty-six specimens, which were embarked at Buenos Ayres; nine, after several accidents, only arrived alive at St. Lucar: "a female *Lama* in young by an *Alpaca*; two *Vigognes*, female one with young by an *Alpaca*; three *Alpaca-Vigognes*, females or mules between the *Vigognes* and the *Alpaca*; and three male *Alpaca*." He proceeds to observe: hence "the *Alpaca* crossed with two other species, and very probably the latter with themselves."—*Dict. Class. N. H.* iii. 435.

THE DEER.

THESE animals, which are spread over all parts of the Globe, are easily recognized by their deciduous horns, which are covered, when they are first developed, with a hairy skin.

It has been supposed that the Deer were not to be found in Africa, but the discovery of a species in Barbary has dispelled that idea; they are rare in that extensive quarter of the world, their place being supplied by Antelopes.

Since the publication of Cuvier's Essay on Deer, in which he described several species from the study of the horns alone, many zoologists have almost entirely depended on the horns for the character of the species, and Colonel Hamilton Smith has been induced to separate some species on the study of a single horn. But the facilities which menageries have afforded of studying these animals, and watching the variations which the horns of the species present, have shown that several most distinct but allied species, as the Stag of Canada and India, have horns so similar that it is impossible to distinguish them by their horns. On the other hand, it has been shown that animals of the same herd, or even family, and sometimes even the same specimen, under different circumstances, in succeeding years have produced horns so unlike one another in size and form, that they might have been considered, if their history was not known, as horns of very different species. These observations, and the examination of the different cargoes of foreign horn which are imported for the uses of the cutler, each cargo of which is generally collected in a single locality, and therefore most probably belong to a single species peculiar to the district,—have proved to me that the horns afford a much better character to separate the species into groups, than to distinguish the allied species from one another.

Colonel Hamilton Smith, in his Monograph of the Genus, separated them into subgenera according to the form of the horns.

In the Proceedings of the Zoological Society for 1836 I drew attention to the glands on the hind-legs as affording very good characters to arrange the genera proposed by Colonel Smith into natural groups, which in most particulars agreed with the geographical distribution of the species.

Dr. Sundeval, in his Essay on Pecora, has availed himself of the suggestions in my paper, and has also pointed out some other external characters, such as the form and extent of the muffle, which afford good marks of distinction in these animals,—such as I believe are much more important for the distinction of the genera and species than those derived from the form of the skull or the modifications of the teeth, or the form and size of the horns; as they are not, like those parts, so liable to alteration from age, local circumstances and other changes during the growth of the animal, and they can be seen in the females as well as the males, which is not the case with the horns, as they can only be observed in the male sex.

The Deer may be thus divided:—

- A. THE DEER OF THE SNOWY REGIONS have a very broad muzzle, entirely covered with hair; the horns are expanded and palmated, and the fawns are not spotted.
- a. The ALCINE DEER have no basal anterior snag to the horns, and a small, bald muffle between the nostrils, as the genus *Alcis*.
- b. The RANGERINE DEER have a large basal anterior snag to the horns, close on the crown or burr, and no muffle, as *Tarandus*.

- b. The DEER OF THE TEMPERATE OR WARM REGIONS have a tapering muzzle, ending in a bald muffle; the fawn, and sometimes the adult, are spotted.
- c. The ELAPHINE DEER have a distinct anterior basal snag to the horns, the muffle broad, and separated from the lip by a hairy band, and the tuft of hair on the outside of the hind-leg above the middle of the metatarsus, as *Cervus* and *Dama*.
- d. The RUSINE DEER have a distinct anterior basal snag to the horns, the muffle very high, and not separated from the edge of the lip, and the tuft of hair on the outside of the hind-leg above the middle of the metatarsus, as *Recervus*, *Panolia*, *Rusa*, *Axis*, *Hyelaphus*, and *Cervulus*.
- e. The CAPREOLINE DEER have no basal anterior snag to the horn, the first branch being some distance above the burr; the suborbital bag (and pit in the skull) small, as *Capreolus*, *Cariacus*, *Blastocerus*, *Furcifer* and *Coassus*.

The *Alcine* and *Rangerine* Deer are confined to the Northern part of both continents; the *Elaphine* and *Rusine* Deer to the Eastern World, the latter almost exclusively to the warmer part of Asia; all the *Capreoline* Deer are peculiar to America. The only exception to these rules are, the Wapity Deer of the Elaphine group is found in Northern America, and the *Roebuck* and *Aihu* of the *Capreoline* group are found in Europe and North Asia; but a species of the genus *Capreolus* has lately been found in the mountains of South America.

The DEER OF THE SNOWY REGIONS have a very broad end to the nose, which is entirely covered with hair, a short tail and palmated horns; the fawns are not spotted, but uniformly coloured like the adult; the skull with a large nose-cavity, and with the intermaxillaries not reaching to the nasal.

The ALCINE DEER or ELKS have no basal snag, the first branch of the horn being considerably above the crown.

1. ALCES, ALCE (*H. Smith*).

The muzzle is very broad, produced, and covered with hair, but there is a small, moist, naked spot in front of the nostrils; the neck is short and thick; the hair is thick and brittle; the throat is rather maned in both sexes; the hind-legs have the tuft of hair rather above the middle of the metatarsus; the males have palmate horns. The nose-cavity in the skull is very large, reaching behind to a line over the front of the grinders; the intermaxillaries are very long, but do not reach to the nasal; the nasals are very short. They live in woods in the northern parts of both continents.

The ELK or MOOSE. *Alces Malchis*.

Dark brown; legs yellower.

Alces, Gesner.—Plin.—*Cervus Alces*, Linn. S. N. i. 92.—Pallas, Zool. R. A. i. 201.—H. Smith.—Richardson, Fauna Bor. Amer. 232.—*Alces Malchis*, Ogilby, P. Z. S. 1836, 135.—*Moose Deer*, Dudley, Phil. Trans. n. 368. 165.—*Elk*, Laws, Carol. 123.—Penn. Syn.—*Elan*, Brisson, H. N. xii. t. 7. Supp. vii. t. 25.—Cuvier, R. A.—*Orignal*, La Houtan, Voy. 72.—Charlev. Nouv. France, iii. 126.—*American Black Elk* (*C. alces* β.), H. Smith, G. A. K. v. 771.—Loss, Russians in Siberia.

Inhabits the Northern regions of America and Europe.

Several naturalists, especially Colonel Hamilton Smith, thought they had observed a difference in the horns of the Russian and American Elks; I have compared numerous specimens from both countries, but can discover no appreciable distinction between them.

The Elks, like most of the other Deer, and especially of the animals which inhabit the cold and mountain regions, present a very considerable difference in size, according to the scarcity or abundance of the food which the locality they inhabit affords, and the development of the horns appears to be greatly influenced by this cause; so that the horns of the animals inhabiting the more barren districts are much less developed than those found in more fertile situations, and I think I have observed this to be the case with both the Russian and the American horns: but on this head naturalists are like to be much misled, as the horns which are imported are generally chosen for their size and perfect development, and the small and less developed specimens are only to be observed in the cargoes of horns which are imported for economic purposes.

These observations are equally applicable to the *Rein Deer*.

The RANGERINE DEER or REINS have a large and well-developed basal branch close on the crown of the horns.

2. TARANDUS, RANGIFER (*H. Smith*).

The muzzle is entirely covered with hair; the tear-bag small, covered with a pencil of hairs; the fur brittle, in summer short, in winter longer, whiter, of the throat longer; the hoofs are broad, depressed, and bent in at the tip; the external metatarsal gland above the middle of the leg; horns in both sexes elongate, subcylindric, with the basal branches and tip dilated and palmated; of the females smaller; skull with rather large nose-cavity, about half as long as the distance to the first grinder; the intermaxillary moderate, nearly reaching to the nasal; a small, very shallow, suborbital pit.

They live in the Arctic Regions in both hemispheres, migrating in flocks, and eating lichens.

The CARIBOU or REIN DEER. *Tarandus rangifer*.

Dark brown in summer, grey in winter. Young: brown, yellow varied.

Tarandus, Plini.—*Rangifer*, Gesner.—*Cervus Tarandus*, Linn.—Pallas, Zool. Ross. A. i. 106.—Cuvier, Mam. Lith. t. —Bennett, Gardens Z. S. 241. fig.—Richardson, Fauna Bor. Amer. 238.—*C. Tarandus sylvestris* (*Woodland Caribou*), Richardson, Fauna Bor. Amer. 250.—*C. rangifer*, Raii Syn. 88.—*C. platyrhynchos*, Vrolich, Rendier, t. 2 (1828).—*C. palmatus* and *C. mirabilis*, Jonston, Quad. t. 36, 37.—*Rein Deer*, Penn.—*Caribou*, Sagard. Theodat. Canad. 751.—*Renne*, Buffon, H. N. xii. 79. t. 10–12; Supp. iii. t. 18*.—*Rhenne*, Cuvier, R. A.—*Caribou* or *Carrebœuf*, French Canadians.—*Oleen*, Russians in Siberia.

Var. Smaller; horns more slender, less palmated; hair short, smooth, close, brown, with throat and belly white in summer; hair very close, thick, waved, brittle and erect and white in winter.

Cervus Tarandus Americanus, H. Smith, G. A. K. v. 773.—*C. Tarandus v. Arctica* (*Barren-ground Caribou*), Richardson, Fauna Bor. Amer. 241. fig. 240, horns.—*Common Deer*, Hearne, Journ. 195. 200.

Inhabits Arctic parts of Europe and America.

Varies exceedingly in size. In the British Museum there are specimens varying from 26 to 28 inches high at the withers, and proportionally as large in the horns and all the other parts. The variety is confined to the barren grounds.

Dr. Richardson observes, "There are two well-marked and permanent varieties of *Caribou* that inhabit the fur countries; one of them (*Woodland Caribou*) confined to the woody and more southern districts, and the other (*Barren-ground Caribou*) retiring to the woods only in the winter, but passing the summer on the coast of the Arctic seas, or on the barren grounds so often mentioned in this work."—*Fauna Bor. Amer.* 299.

The large Siberian variety are ridden on by the Tungusians. They also use them for draught, as the Laplanders do the smaller variety.

They have a large variety in Newfoundland, nearly as large as a heifer, having very large and heavy horns. There are some horns of this variety in the British Museum. M. Middendorf informed me that the horns of the large Siberian variety were as large as, and greatly resembled, the horns from Newfoundland (Nova Scotia) in the British Museum Collection.

Pallas observes, "Americæ forte continua gregatim verno tempore per glacies admigrant, paulo diversi a Siberiæ inquilinis et verosimillime Americani."—*Zool. Ross. Asiat.* i. 208.

The DEER OF THE WARM OR TEMPERATE REGIONS have a tapering nose, ending in a naked, moist muffle; they generally have a well-developed tail, distinct tear-bag, and rather long false hoofs; their fawns are spotted, the spots generally disappearing in the adult, or only to be seen when the animals are in high condition; the fur is shorter and fulvous in the summer, becoming greyer in the winter; the skulls have a moderate nose-cavity, and the intermaxillaries reaching to the nasal bones.

The ELAPHINE DEER or STAGS have a shallow, broad muffle, narrowed and rounded below, and nearly separated from the edge of the lip by a hairy band, which has only a narrow interruption in the middle, and rather elongated ears; they have rough horns, generally supported on a more or less long process of the frontal bones, furnished with a frontal basal branch or snag close on the burr or crown; the outer side of the hind-legs has a tuft of hair placed rather above the middle of the metatarsus, and another tuft on the inner side of the hock.

They are (except the *Wapiti*) exclusively confined to the woods of the Old or Eastern World.

3. CERVUS, ELAPHUS (*H. Smith*), CERVUS and PSEUDOCERVUS (*Hodgson*),

has round, erect horns, with an anterior basal snag, a medial anterior snag, and has the apex divided into one or more branches, according to the age of the animal; a well-developed tear-bag; narrow triangular, compressed hoofs; they are covered with brittle, opaque hairs; the rump is generally ornamented with a pale mark; skull with a large, deep, suborbital pit.

The *True Stags* have one or two branches on the middle of the front of the beam.

The AMERICAN KIND have rather broad semicircular hoofs, a very short tail, and the withers covered with softer hair in winter. *Strongyloceros*.

The WAPITI. *Cervus Canadensis*.

Red brown; rump with a very large pale disk extending far above the base of the tail, and with a black streak on each side of it; male with hair of throat elongated, black, with reddish tips.

Stag, Dale, Phil. Trans. n. 444, 384.—*Cerf de Canada*, Perr. Anim. ii. 55. t. 45?—Cuvier, R. A. i. 256.—*Cervus Canadensis*, Brisson.—*Cervus Elaphus*, var. *Canadensis*, Erxl.—*Cervus Strongyloceros*, Schreb. t. 247.—Rich. Faun. Bor. Amer. 251.—*C. major*, Ord.—*Cervus Wapiti*, Leach, Journ. Phys. lxxxv. 66.—*American Elk*, Bewick, Quad.—*North-Western Stag*, *C. occidentalis*, H. Smith, G. A. K. iv. 101. t. f. 2, horn.—Fischer, Syn. Mam. 614, not Syn.—*Wapiti*, Warden, Etats Unis, v. 638.—Wied, Voy. Amer. Sept. iii. 302.

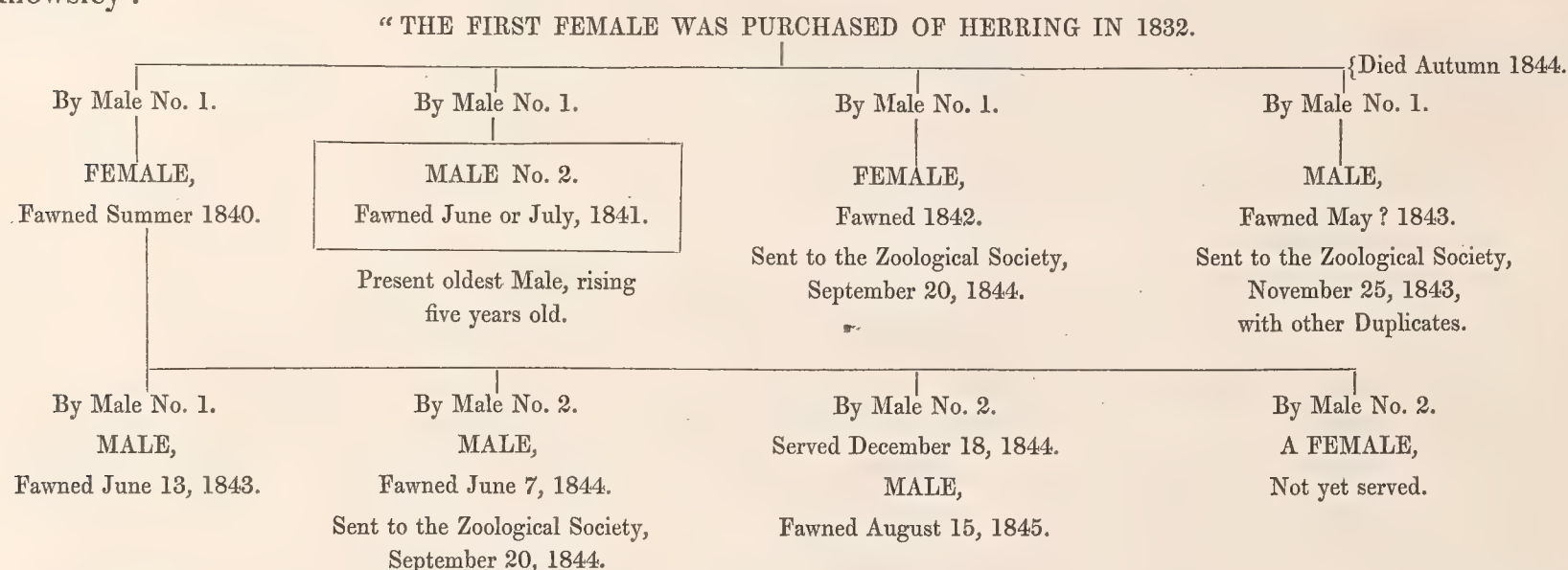
Var. Smaller.

Red Deer (or *Canadian Stag*), Warden, Etats Unis, v. 637.—*Elk*, Lewis and Clerk.—*Stag*, Penn. Arct. Zool. i. 27.—*Wewaskiss*, Hearne, Journ. 360.

Inhabits North America.

Female (in summer) red-brown; ears, middle line of the back of the neck, and back of rump and front of legs blackish; rump mark yellowish.

The Earl of Derby has forwarded me the following "Pedigree of the WAPITI DEER bred at Knowsley :"—



"Male No. 1. was purchased of Herring in autumn of 1838. Sent to the Zoological Society September 20, 1844.

"Male No. 2. is the one marked above with lines."—March 6, 1846.

The species of the WESTERN WORLD have narrow, triangular hoofs, a moderate tail, and are covered with harsh hair. *Cervus*.

The STAG. *Cervus Elaphus*.

Brown; rump with a pale spot extending rather above the upper surface of the base of the tail.

Cervus, Plin.—Gesner.—*Tragelaphus*, Gesner (old male).—*Cervus Elaphus*, Linn.—*C. vulgaris*, Linn.—*C. nobilis*, Klein.—*C. Germanicus*, Brisson.—*C. Elaphus* β . *Hippelaphus*, Fischer, Syn. (old male).—*Stag*, or *Red Deer*, Pennant.—*Cerf*, Buffon, H. N. vi. t. 9.—*Cerf commun*, Cuvier.—F. Cuvier, Mam. Lith. t. .

Inhabits Europe.

Mr. Blyth described a variety as the HUNGARIAN STAG (Mus. Asiat. Soc. Beng. 1841, 750. t. 3. f. 11).

Lord Derby observes :—

"As the question of the Age of the Stag has been very much a *quæstio vexata*, and there are but few instances in which it can be spoken of with any degree of accuracy, I am inclined to think it might be of some use to state what is known here relative to one of our Stags, and who has latterly been honoured with a place in the National Collection at the British Museum. Old Billy, by which name he was well known to all in this neighbourhood, was bred in the Park at Knowsley in 1819, and at the usual age of three years was caught and sent up (1822) for the supply of the Hunting Paddocks kept by my late Father for that sport at The Paps, Surrey, and after being regularly hunted during some years, without any injury being sustained by him, had the singular good fortune of returning to his native haunts in this Park, where for

many seasons he continued the acknowledged Head of all the Deer, though he was not without a frequent struggle for the dominion with some of his aspiring younger rivals. In one of these combats it is supposed that he received a wound which made him for a time rather lame; in consequence of which the keeper, he thinks in 1830, enticed him into the yard behind his house, and there doctored him till his recovery, upon which in a few months he was again restored to the full range of the Park. From that period, however, he never forgot the benefits he had received in the keeper's yard, and in subsequent severe seasons would often make his way into it and go to the bin from which the keeper had been accustomed to give him acorns, &c. during his illness; and if he could contrive to open, would proceed to help himself. Even at other times, if the keeper met him in the Park, and called to him by his name, he would stop and stand still, look round him, and on recognizing his friend, would leave his hairy comrades and meet the caresses of his benefactor. On the keeper naming this once to Lord S., while walking in the Park, and Billy being in sight, the keeper called to him, and Lord Stanley, in the man's company, went up to him, spoke to, and patted him. From that time Lord S. shared also in the influence the keeper had over him, so as even to be able to introduce other persons to Billy's acquaintance,—among them myself; but I have never ventured to exercise the same familiarity with him as my Son or the keeper, though whenever I have met him in the Park, and called to him by name, he would stop, recognize it, and advance towards me, even if I was in a carriage, though he would not then come very near up to it. He did not seem to care even if his friends had a gun in their hands, but a dog, especially a strange one, he had a great dislike to. Some dogs that the keeper kept in his back yard, Billy was very good friends with there, but if he met them loose in the Park they were as strangers to him. Thinking, both as a fine animal, and also on account of the singular circumstances attending him, that it would be worth while to retain a Picture of him, Billy, in the year 1842, stood for his Portrait to a well-known talented artist of Liverpool in the line of animals, Mr. Richard Arsdell, who was at that time taking likenesses of several of the animals then in the Menagerie here, which Picture now hangs opposite to the Entrance Door in the Hall at Knowsley. For the two or three last years of his life poor Billy had become very infirm, and so evidently declining, that it was clear he could not longer resist his competitors unaided. The keeper therefore adopted the plan of placing him in a small clump of oldish trees, fenced in from the general Park during the winter months, and in that shelter he died in March 1845, having evinced for some time the infirmities of his advanced age. I do not, however, think that there had been *much* alteration in his Horns for the last few years, though what alteration there *was*, was for the worse; and at the last his horns were so *very* indifferent, that when Thompson sent up the body to the British Museum, he did not send the last horns with which he died, but a somewhat earlier and rather better pair, as the last were injured and broken in the animal's last struggles. Shaw tells me it was the last three winters that he was kept up in the plantation, from whence he would often lead him across the front green into his old quarters in the yard, and when there, if he could find an opportunity by the door being open, he would often enter the kitchen and lie down like a dog before the fire."

The BARBARY DEER. *Cervus Barbarus*.

Dark brown; obscurely white spotted, with a very indistinct, greenish brown, broad dorsal line, with a pale yellow spot extended considerably above the base of the tail; back of haunches white, with a dark stripe on each side.

Cervus Barbarus, Bennett, MSS. Catal. Gardens Zool. Soc.—*C. Elaphus Corsicanus*, Erxl., from .—*Cerf de Corse*, Buffon, H. N. vi. 95. t. 11.—*Burk-Goat (Al-Wassai)*, Moors (see Griffith, A. K. v. 775).

Inhabits Coast of Barbary; Tunis.—Corsica??

The Earl of Derby observes:—

"A Stag and two Hinds were sent for me by Sir Thomas Reade; but one Hind never reached Knowsley, having, as I understood, died on board, in the river Mersey, before they could be landed. The survivors are still living and well, in March 1846, and have produced as below:

A PAIR,				
Presented by Sir Thomas Reade, August 26, 1841.				
A FEMALE,	A FEMALE,	A FEMALE,	A MALE,	Served in Oct. 1845.
Fawned in Summer 1842.	Fawned in May? 1843.	Fawned June 4, 1844.	Fawned May 26, 1845.	
Killed by the Sire, Dec.? 1842.	Died Sept. 19, 1845.			

"I have just learned from J. T. that we have lost the younger of the *Two Barbary Hinds*, which you may therefore as well mark off on the pedigree. The other three are doing very well, and I dare say some of these will be among Fraser's collection."—March 24, 1846.

It is probable that this Deer is the same as the Deer which Buffon describes under the name of the *Cerf de Corse*, which has been regarded as a variety to be distinguished by the smallness of its size. But

Buffon observes, that he believes the "size to depend on the scarcity of nourishment; for when moved to better pastures, in four years they became higher, larger and stouter than the Common Stags."—*Hist. Nat.* vi. 95.

The BARA SINGA OR MORL. *Cervus Wallichii*.

Brown, with a very large white spot on the rump, extending on back of the haunches and far above the base of the tail; the horns with two basal and one or two apical branches.

Cervus Pygargus, Hardw. Linn. Trans.—*Cervus Wallichii*, Cuvier, Oss. Foss. iv. 50.—F. Cuv. Mam. Lith. from Hardw. Icon.—Sundev. Pecora, 55.—H. Smith, G. A. K. iv. 103. t. (from Indian drawing).—*Jaareal Stag*, Blyth, Journ. Asiat. Soc. Bengal, 1841, 750. t. f. 7, young horn.—Hodgson, Icon. ined. t. 198, called *Gyana*.—*Pseudocervus Wallichii*, Hodgson, Journ. Asiat. Soc. Bengal, x. 914, xi. 284.—? *Cervus Caspianus* or *Hangool*, Falconer, MSS.—Gray, Cat. Osteol. Sp. B. M. 147.—? *Cervus Cashmeriensis*, Gray, Cat. Osteol. Sp. B. M. 65.—*Kashmir Stag?*, Blyth, P. Z. S. 1840, 72; Journ. Asiat. Soc. Bengal, 1841, 750. t. f. 8, 9.—*Persian Deer*, *Maral* or *Gevezu* or *Gookoohee*, MacNeil, P. Z. S. 1840, 11.—Blyth, Journ. Asiat. Soc. Bengal, 1841, 750. t. f. 10.

Inhabits Cachir (*Hodgson*); Persia (*MacNeil*).

The skull of Dr. Falconer's *Cashmeer Stag* is 15 inches long; the suborbital pit is oblong, triangular, and rather deep. The skull and horns are very like Mr. Hodgson's specimen of *Cervus affinis*, but they are considerably smaller.

Sir John MacNeil informs us they are called by the Persians *Maral*, or *Gevezu*, or *Gookoohee*, and are frequently noticed in their literature. It is found in all the wooded mountain districts of Persia, but apparently does not occur in the central parts of the country. They rarely descend into the plains. During the summer they are found in the highest wooded parts of the mountains, and during the winter in the lower ravines, near their bases, where they are frequently tracked in the snow. The horns of the adult males closely resemble those of the Red Deer of this country; insomuch that I doubt whether an unscientific observer could distinguish them, except by the superior size of those of the *Maral*.—P. Z. S. 1840, 11.

The SAUL FOREST STAG. *Cervus affinis*.

Pale brown; rump without any distinct pale mark; skull 16 or 17 inches long; suborbital pit large, oblong, trigonal, rather deep.

Cervus affinis (*Mool Baratingha*, or *Royal Stag of the Morung*), Hodgson, Icon. ined. B. M. n. 197; Journ. Asiat. Soc. Bengal, x. 741, 914; Calcutta Journ. N. H. iv. 291.—Sundev. Pecora, 131.—Gray, Cat. Ost. Sp. B. M. 65.—*C. Elaphus*, Hodgson, Journ. Asiat. Soc. Bengal, iv. 648.—*C. Wallichii*, part, Gray, Cat. Hodgson's Coll. in B. M. 32.—*C. Wallichii*, var. Blyth, Journ. Asiat. Soc. Bengal, 1841, 747.

Inhabits India; Saul Forest.

Mr. Hodgson, in his figure of this animal, does not represent any pale spot on the rump: if this is correct, it must be a most distinct species. Dr. Falconer informs me the *Cashmere Stag* has a large white rump.

The SIKI. *Cervus Sika*.

Dark brown; cheeks and throat rather paler; rump brown, without any pale spot; tail pale, white beneath; hair harsh; horns rather slender, with a basal and medial snag, and a subapical internal one.

Cervus Sika, Schlegel, Fauna Japon. t. 17.—Sundev. Pecora, 55, 131.—*C. Sitza*, Temm. Mus. Leyden.

Inhabits Japan. Mus. Leyden.

4. DAMA (*H. Smith*), PLATYCEROS,

has the upper part of the horns expanded, smooth, and branched on the hinder edge; a rather elongated tail; a well-developed tear-bag; narrow triangular compressed hoofs; they are covered with thin, rather adpressed hairs, and have the hair of the nape reversed; the fur is spotted in summer; the skull with a short broad face, an oblong, rather shallow, infraorbital pit, and short broad nasals.

The FALLOW DEER. *Dama vulgaris*.

Fulvous; white spotted, with the longitudinal streak on the lower part of the side, and the line across the haunches white.

Var. From nearly black to nearly pure white.

Platyceros, Plini.—*Cervus platyceros*, Raii Quad. 85.—*Cervus dama*, Linn.—*Dama vulgaris*, Gesner, Quad. 335. f.—Gray, Cat. Osteol. Sp. B. M. 65.—*Fallow Deer and Buck*, Pennant.—*Daim et Daime*, Buffon.—*Daim fauve*, F. Cuvier.—*Cervus coronatus*, H. Smith, G. A. K. iv. t. f. 4, from monstrous horns.

Var. Blackish

Cervus mauricus, F. Cuv. Bull. Soc. Phil. 1816.—*C. Dama maura*, Fischer.—*Daime noire*, F. Cuv. Mam. Lith. Inhabits Persia. Domesticated in Europe.

This species is represented in the sculptures from Nineveh.

The **RUSINE DEER** or **SAMBOOS** have a large moist muffle, which is as high as broad, and extend to the edge of the upper lip; hind-leg with a large tuft of hair rather above the middle of the metatarsus, and with a pencil of hair on the inner side of the hock; a moderate tail, broad, short ears, and the fur consisting of hard, rather shining, thick, depressed hair; they have no white mark on the rump. The horns are cylindrical, generally rather longly peduncled, with a distinct anterior basal branch or snag close on the burr or crown, and are forked, and sometimes reforked, at the tip; they have no medial snag. The skulls have a large, very deep, suborbital pit. They are confined to South-Eastern Asia and its islands.

In some the upper part of the horns is variously branched.

5. PANOLIA (*Gray*).

The horns round, curved backwards and outwards, with a large anterior basal snag close on the burr; the upper part bent in, forked, becoming rather expanded and branched on the inner or hinder edge; the fur formed of rather rigid, flattened hair; muffle large; skull with a narrow face, a large, oblong, very deep suborbital pit, and the nasals short, broad, and dilated behind; the frontal snag of the horns often has a tubercle or branch at the base.

The **SUNGNAL**. *Panolia Eadii*.

Panolia Eadii, Gray, Cat. Hodgson's Coll. B. M. 34.—*P. acuticornis*, Gray, Cat. Mam. B. M. 180.—*P. platyceros*, Gray, Cat. Mam. B. M. 180 (adult horn).—*Cervus lyratus*, Schinz, Syn. ii. 395.—? *Cervus Smithii*, Gray, Proc. Zool. Soc. 1837, 45.—*Cervus Eadii*, Calcut. Journ. N. H. ii. 413. t. 12.—*Cervus (Rusa) frontalis*, McClelland, Calcut. Journ. N. H. i. t. 12. f. 1; ii. 539; iii. t. 13.—Sundeval, Pecora, 132.

Inhabits India.

General Hardwicke has a drawing of a Deer, the frontal snag of the horns very much elongated, and apparently forked: Colonel Hamilton Smith made an "improved" drawing from the sketch; and in the Proceedings of the Zoological Society for 1837 I mention the species under the name of *C. Smithii*, p. 48.

I am now doubtful if the sketch might not have been intended for this species or a new one allied to it.

6. RUCERVUS (*Hodgson*), RUSA, sp. (*H. Smith*),

has cylindrical horns, with an anterior basal branch, and are repeatedly forked at the tip; muffle large, high, continued to the edge of the upper lip below; they have a rather short, thick tail, a shortish face, a well-developed tear-bag, broad rounded ears, covered with hair, and narrow compressed hoofs. The fur is formed of rather soft adpressed hairs; they have no pale mark on the rump, and are indistinctly spotted. The skull has an elongate face, with a large nose-opening, and an oblong, rather shallow, suborbital pit.

The **BAHRAIYA**. *Rucervus Duvaucellii*. TAB. XL. Summer. TAB. XLI. Winter.

Yellowish brown, without any rump spot; back with an indistinct dark streak, with a row of white spots on each side; sides not spotted; hair black, with yellow tips; neck with rather longer hair; throat, chest and belly with longer, scattered, greyish white hairs; muzzle and front of leg dark; chin white.

Cervus Duvaucellii, Cuvier, Oss. Foss. iv. t. 29. f. 6, 8.—*Rucervus Duvaucellii*, Gray, Cat. Hodgson's Coll. B. M. 33.—*Rucervus elaphoides*, Hodgson.—*Cervus Bahrainja*, Hodgson.—*C. enclodocerus*, Hodgson.—*C. Bahrainja*, Hodgson, P. Z. S. 1836, 46.—*C. Euryceros*, Knowsley, Menag. t. 40, 41.—*Bahrainja*, Hodgson.

Inhabits India.

The specimen that was at Knowsley has recently died, and is in the British Museum. There is a beautiful male now living in the Zoological Gardens.

The **TRUE RUSAS** have the upper part of the horns simply forked.

7. RUSA (*H. Smith*), CERVUS HIPPELAPHI ** (*Sundeval*).

They are covered with hard, rigid, very thick hairs; they are not, or only obscurely, spotted; the horns are placed on a moderately long peduncle, have an anterior frontal snag close on the crown, and are simply forked at the tip.

The LARGER KINDS have the hair of the neck elongated, forming a kind of mane, at least in the males.

The SAMBOO. *Rusa Aristotelis*.

Tail not floccose, brown, rather darker at the end; blackish brown, with the feet, the region of the vent, and a spot over the eyes fulvous. Male maned. Young obscurely white spotted (*Hodgson*).

Gona Rusa, Daniel, Ceylon, t. —*Cervus Aristotelis*, Cuvier, Oss. Foss. iv. 502. t. 39. f. 10.—F. Cuv. Mam. Lith. t. —Sundeval, Pecora, 55.—*Cervus Hippelaphus*, *C. Aristotelis*, and *C. heteroceros*, Hodgson, Icon. ined.—*Rusa Aristotelis*, H. Smith.—Gray, Cat. Hodgson's Coll. B. M. 67; Osteol. Spec. B. M. 67.—*Cervus unicolor*, H. Smith, G. A. K. v. 780.—*Cervus Bengalensis*, Schinz, Syn. Mam. ii. 390.—*Daim noir de Bengal*, Duvaucell, Asiat. Res. xv. 157.—*Cerf noir de Bengal*, F. Cuvier, Menag. Lith. t. —*Cervus equinus* (*Samboo Deer*), Bennett, Tower Menag. 185, fig.—*Elk*, Indian Sportsmen.—Sykes, Proc. Zool. Soc.—Var. *Cervus heteroceros*, Hodgson, J. A. S. Beng. 1841, 722. t. —♀ Var. ? *Biche de Malacca*, F. Cuv. Mam. Lith. t. —*Cervus Malaccensis*, Fischer, Syn.

Inhabits India; Ceylon.

The skull is about 17 inches long, and has a very deep, oblong, subtriangular, suborbital pit.

The specimen from Ceylon, in the Zoological Gardens, does not appear to differ from the common Samboos from India.

The SPOTTED RUSA. *Rusa Dimorphe*.

Red brown; back with distinct series of small white spots; sides indistinctly white spotted; limbs paler; neck and belly blackish; chin white; the horns (deformed?). Young bright fawn-red, white spotted.

Cervus Dimorphe, Hodgson, Journ. Asiat. Soc. Bengal, 1844, t. ; Ann. & Mag. Nat. Hist. xiv. 74.—Sundeval, Pecora, 132.—*Rusa Dimorpha* (*Hodgson's Rusa*), Hodgson in Gray, Cat. Hodgson's Coll. in B. M. 33.

Inhabits Saul Forest; Morang

The RUSA OR SMALLER SAMBOO. *Rusa Equinus*. TAB. XLIII.

Brown, not spotted; tail rounded, floccose, black at the tip; hair (summer) elongate, rigid, thick, waved. Young very obscurely spotted; hair rigid and rough.

Rusa, Raffles, Linn. Trans. xiii. 263.—*Cervus equinus*, Cuvier, Oss. Foss. iv. 44. t. 5. f. 30, 37, 38; t. 5. f. 42.—H. Smith, G. A. K. iv. 112. t. —Sundeval, Pecora, 55.—S. Müller, Nederl. Verh.—*Eland* or *Elk* of the Dutch Sportsmen.

Inhabits Sumatra; Borneo.

The MIJANGAN BANJOE. *Rusa Hippelaphus*.

Greyish brown; tail not floccose, brownish at the tip; anal region not pale; cheeks and upper part of the neck of the males maned; hair (summer) short, rigid, close-pressed, not waved. Young: hair smooth.

Rusa ubi, *R. saput* and *R. Tunjuc*, Raffles, Linn. Trans. xiii. 260.—*Cervus hippelaphus*, Cuvier, Oss. Foss. iv. t. 5. f. 31, 34 & 42.—F. Cuvier, Mam. Lithog. t. —Raffles, Mem. 645.—*Cervus Tunjuc*, Vigors, in Raffles' Memoir, 645.—*Cervus Rusa*, S. Müller, Nederl. Verh. 45. t. 43.—*Great Muntjac*, Waterhouse, Cat. Mus. Zool. Soc. 1839, 39.—*Cerf noir de Bengal*, F. Cuvier, Mam. Lithog. t. 2, in summer.—*Cervus Leschenaultii*, Cuvier, Oss. Foss. v. , from horns only.

Var. Smaller. Eydoux, Guerin, Mag. Zool. 1836, 26.—*Cervus Molluccensis*, Quoy.—*Cervus Rusa Molluccensis*, S. Müller, Nederl. Verh. t. 45; Mus. Leyden, 1845.—*Cervus Rusa Timorensis*, Mus. Leyden, 1845.

Inhabits Java.

This species was living some time at Knowsley, and bred there. In all its states it was very distinct from the Samboo of Continental India. The horns are similar to those of *R. Equinus*, but the body and horns are smaller, and the hair of the young is smoother.

The following notes were made at Knowsley, October 1846:—

"*Cervus Rusa*," ♂ ♀ and jun., from Java. Yellowish (in winter), female and young rather browner, blackish where rubbed; neck rather maned (with longer hair), especially in the male; front, or rather upper part of the face, black, with a streak over each eye; tail elongate, slender, with a dark tuft or club at the end; skin of anus and scrotum pale whitish; knee of ♂ with tufts in front; (♂) height of shoulder 35 inches; ♀ rather smaller; front of upper part of throat, belly and inside of thigh whitish; nose, like back, chin and edge of nostrils, white; no black band round the muzzle and across the chin; anal disk none; hair very rigid, thick, quill-like.

This animal differs from the Samboo in size and colour. The *Samboo* near to it at the same time was nearly black, the front of the muzzle rounded, the nose black, forming a band across the chin; front of chin (only) white; tail all black; face paler than back, and more grisled, but uniformly coloured, without any black streak over the eyes or up the side of the nose; vent flesh-coloured. Much larger. Thompson says the *C. equinus* is different. They have the skin at Knowsley.

The EARL OF DERBY observes:—

“In reply to the query in your last relative to the proportion of size between the two *Cervi* I had here lately, *Rusa* and *Equina*, of which I sent you the hair, they were very much of a size; but, as in almost all of the tribe, the male was rather the largest. I should have said, from my own recollection, that though very much alike in size in all ways, that the male was the higher, but the female the more bulky; but John (Thompson) assures me the male had it both ways, and would certainly have weighed a good deal heavier than the hind. We will not forget your wishes about the hair of the other Deer.

“The packets I sent you of Cervine hair were both from the same part of the two animals, the ribs.”

“By the way, did you, while they were still in London, see the two Deer Westermann has lately sent to me by the name of *Cervus Moluccensis* of Müller. They are small, and very poor, and Thompson cannot be persuaded that they are of a different species from those Westermann before sent me as the *Rusa*, and which have bred here so well with us. He thinks them only a dwarf variety of that, or at least the female he feels some doubt about; but I cannot think that Müller could have made such an error. My old *C. Rusa* is now a splendid animal. The new one's horns are too small to judge by, and his tail is very different, I think. Our young ones are larger than the new arrival.”—Oct. 17, 1848.

The SMALLER RUSAS have no mane; the peduncles of the horns are rather elongated, and covered with hair.

The SMALLER RUSA. *Rusa Peronii*.

Brown, paler beneath; hair rigid, thick, ringed; muzzle dark; tail brown, floccose; anal disk white; the hind part of the feet hairy; the horns are thick and heavy.

Cervus Peronii, Cuvier, Oss. Foss. iv. 46. t. 5. f. 41, 45.—Sundev. Pecora, 56.—*Cervus Kuhlîi*, S. Müller, Nederl. Verh. 45. t. 44.—Sundev. Pecora, 56.—*Rusa Kuhlîi*, Gray, List Osteol. Spec. B. M. 68.

Inhabits Timor, Luboc, Bavian and Ternate. Specimen in Brit. Mus.

PHILIPPINE RUSA. *Rusa Philippinus*.

Forehead brown; end of nose and eyebrows brownish; feet behind naked; hair rigid, not waved.

Cerv de Philippine, Desm. Mamm. 442.—*Cervus Philippinus*, H. Smith, G. A. K. iv. 147. t. v. 803.—Fischer, Syn. 622.—Sundev. Pecora, 56.

Var.? Tail black, dependent; front of face dark.

Cervus Marianus, Cuvier, Oss. Foss. iv. 45. t. 5. f. 30, 37, 38, 46.—H. Smith, G. A. K. iv. 115. t. (from Mus. Paris).—Fischer, Syn. 453.—Sundev. Pecora, 57.

Inhabits Philippines.

The Philippine *Rusa* or Hog Deer was living at Knowsley for some years; it has lately died.

This species has the horn or elongated peduncle, like the *Muntjacs*, but it is easily distinguished from them by the absence of the ridge and of the grooves on the face.

The LITTLE RUSA *Rusa lepida*.

Reddish brown; back and sides varied with pale, spotted hair; vent disk small, white, black edged above; tail longly hairy, white, above black; face brown, with a roundish white spot in front of the usual oval black spot; horns smooth, slender, nearly straight, elongate, the basal snag bent down on the forehead.

Cervus (Hippelaphus) lepida, Sundev. Pecora, 57.

Inhabits Java. Mus. Frankfort.

Scarcely as large as a Roebuck. Only known from Dr. Sundeval's description.

8. AXIS (*H. Smith*), HIPPELAPHUS *** (*Sundev.*).

Covered with moderately thick, polished hairs; fulvous and beautifully white spotted at all seasons; the face is elongate, narrow, and the ears large, rather elongate and acute, with a rather elongate tail,

and nearly equally long, slender legs; the horns are placed on moderately long peduncles; the skull is elongate, narrow, with an oblong, rather small, deep suborbital pit.

The AXIS or CHILTRA. *Axis maculata*.

Fulvous, with a black dorsal streak, edged with a series of white spots; sides with many white spots in an oblique curved line, and with a short white streak obliquely across the haunches.

Young fawn, spotted exactly like the adult.

Axis, Plin.?—Buffon, H. N. xi. t. 38, 39.—Cuvier, Menag. Mus. t. ; Oss. Foss. iv. 38. t. 5. f. 24, 29.—*Cervus Axis*, Erxl.—Schreb. t. 250.—Bennett, Gard. Zool. Soc. 253.—Sundev. Pecora, 57.—*Axis maculata*, Gray, Cat. Mamm. B. M. 178.—*A. major*, Hodgson, Journ. Asiat. Soc. Bengal, x. 914.—*A. minor*, Hodgson, Journ. Asiat. Soc. Bengal, x. 914.—*A. medius*, Hodgson, Icon. ined.—*Cervus pseudaxis*, Gervais, Voy. Bonite, 64. t. 12; Institute, 1841, 419.—Sundev. Pecora, 57.—*C. Axis Ceylonensis*, H. Smith.

Var. Blackish. *C. nudipalpebra*, Ogilby, P. Z. S. 1831, 136.—Sundev. Pecora, 57. 131.

Inhabits India.

The horns of this species vary greatly in size. Pennant describes two Deer under the names of *Greater Axis*, Penn. Syn. 52; Quad. 106 = *C. Axis* γ , Gmelin, *Middle-sized Axis*, Penn. Quad. 106 = *C. Axis* β , Gmelin, from the horns alone: these are probably only large-horned examples of the common species.

9. HYELAPHUS (Sundev.), *Axis*, sp. (*H. Smith*).

Covered with moderately thick, polished hair; fulvous, and spotted in the summer; with a rather elongated tail, and rather short legs, the front being rather the shortest; the face is short, broad, and arched in front; the ears short and rounded; the horns are placed on moderately long peduncles.

The LUGNA PARA or SHGORIAH. *Hyelaphus porcinus*. TAB. XLII.

Brown or yellowish brown, with an indistinct darker dorsal streak, and with obscure whitish spots, but without any white streak on the sides or haunches; in the winter brown and spotless; front of face and legs darker; line down the front and the inside of the thighs white.

Porcine Deer, Penn. Syn. 42. t. 8. f. 2.—*Cerf Cochon*, Buffon, Supp. iii. 122. t. 18 (in summer).—*Cervus porcinus*, Zimmerm.—Schreb. t. 251.—F. Cuv. Mamm. Lith. t. .—*Hyelaphus porcinus*, Sundev. Pecora, 58.—Gray, Cat. Osteol. B. M. 67.—*Axis porcinus*, Hodgson, Journ. Asiat. Soc. Bengal, x. 914.—Gray, Cat. Hodgson's Coll. B. M. 33.—*Cervus niger*, Hamilton, Icon. ined.—Blainv. Bull. Soc. Philom. 1816, 76.—Fischer, Syn. 454.—Sundev. Pecora, 60. 132.

Inhabits India.

Easily known from the *Axis* by being lower on its legs, and there is no distinct black dorsal streak, nor white streak on haunches; the tail bushy, and often carried erect: the males and females in summer are reddish brown, with numerous white spots, the middle of the back rather darker; in winter the whole fur becomes blackish brown, and the spots disappear: the horns are generally short, with only short snags or branches, but they are sometimes as large as those of the *Axis Deer*.

Lord Derby observes:—

“In the year 1837 I purchased a fine *Hog Deer* from Cross, of the Royal Surrey Zoological Gardens; and my present old male, the father of all the fawns since bred, was bought of Herring in 1839. The old female has produced seven fawns, of which the first, a male, sold to Castang, was fawned in 1840; the second, a female, in February 1841; the third, a male, in December 1841; the fourth, a male, October 1842, given to Lord Fitzwilliam; the fifth, a female, in October 1843; the sixth, a male, June 12, 1844; the seventh, March 1, 1845. She is again in young, and should fawn January 9, 1846. The first female she bred produced a female, April 6, 1844; secondly, a male, born dead, in March 1845; and she also should fawn again, January 22, 1846. The next female (fawned in 1843) should produce a fawn, January 23, 1846. You will perceive that the yeaning-time, and consequently the rut, is at all times of the year; that they receive the male very soon after yeaning, and breed very rapidly and early; the gestation being about eight months, as with most Antelopes. You see by this account that I have now bred a very nice little herd, and am expecting three more next month. In addition to which, I have some few others imported by Whitfield, and am sending up a pair to the Queen, by Thompson.”

“We expect three more *Hog Deer* fawns.”—Dec. 13, 1845.

“We have two more of the *Hog Deer* fawns; a small female yesterday, and a good male today.”—Jan. 3, 1846.

10. CERVULUS (*Blainv.* 1816), MUNTJACUS (*Gray*, 1821), STYLOCERUS (*H. Smith*),
PROX (*Ogilby, Sundev.*),

with the horns on elongated pedicels, supported by longitudinal ridges on the face, which have a naked, moist groove on their side; the canine teeth are exerted; the tear-bags are large and deep; the tail elongate and tufted; the hoofs triangular, and partly united in front by a web; the false hoofs are small and transverse; they are covered with thin shining hair, and are not spotted; they have no tuft of hair on the hind-legs; skull with a very large, deep, nearly hemispherical suborbital pit.

The KIJANG OR MUNTJAC. *Cervulus vaginalis*.

Dark reddish brown; narrow streak on the front edge of the thigh white.

Kijang, Marsden, Sumatra, 94.—*Cervus Muntjac*, Zimmerm. Schreb. t. 254.—Horsf. Java, vi. t. 1.—Raffles, Mem. 645.—*Prox Muntjac*, Sundev. Pecora, 61.—*Cervus vaginalis*, Bodd, Elinc. i. 136.—*C. subcornutus*, Blainv. Schreb. t. 254 B. f. 2.—*Muntjacus vaginalis*, Gray, Cat. Mamm. B. M. 173.—*Cervus aureus*, H. Smith, G. A. K. iv. 148. t. v. 805.—*Ribbed-face Deer*, Penn.—*Chevreuil des Indes*, Allam, Buff. Suppl. v. 41. t. 17, vi. 195. t. 26.—Cuvier, Oss. Foss. iv. t. 5. f. 48, t. 3. f. 49, 54.

Inhabits Sumatra; Java.

This chiefly differs from the following in being darker-coloured.

The KEGAN OR KAKER. *Cervulus moschatus*.

Bright reddish yellow; streak on front of thigh and under part of the tail white; chin and gullet whitish; hair not ringed.

Var. With a triangular white spot on each side of the chest.

Musk Deer of Nepal, Ouseley, Orient. Collect. ii. t. —*Cervulus moschatus*, Blainv. Bull. Soc. Phil. 1816, 77.—Schreb. t. 254 B. f. 1.—H. Smith, G. A. K. iv. 149. t. v. 806.—*Cervus moschus*, Desm. Mamm. 441.—*C. Ratwa*, Hodgson, Journ. Asiat. Soc. Bengal, i. 146. t. head; P. Z. S. 1834, 99.—Royle, Flora Cashm. t. 5. f. 2.—*Stylocerus Ratwah*, Hodgson, Journ. Asiat. Soc. Bengal. x. 914.—*Muntjacus vaginalis*, part, Gray, Cat. Hodgson's Coll. B. M. 31.—*Prox Ratwa*, Sundev. Pecora, 62.—*P. albipes*, Wagner, Suppl.—Sundev. Pecora, 62.—*P. stylocerus*, Wagner, Suppl.—Sundev. Pecora, 62, 64.—*Cervus melas*, Ogilby.—*Prox melas*, Sundev. Pecora, 62.

The CHINESE MUNTJAC. *Cervulus Reevesii*.

Greyish brown; hair short, paler ringed.

Cervus Reevesii, Ogilby, P. Z. Soc. 1838, 105.—*Prox Reevesii*, Wagner, Sundeval, Pecora, 62.

Inhabits China.

Mr. Ogilby observes, this species has a longer head and tail than the Common Indian Muntjac, also less red and more blue in the general shades of colouring, and is readily distinguished by the want of the white over the hoofs, which is so apparent in its congeners. The fawn is spotted.

The Earl of Derby has these three kinds at Knowsley; but they breed together, and it has hence become impossible to discriminate the mules from the original species.

Lord Derby observes:—

“We have bred the *Muntjaks* here very regularly; but ours will prove cross-bred, being from China and from Java.”—Oct. 25, 1845.

The CAPREOLINE DEER OR ROES have rugose, very shortly peduncled horns, without any basal snag or branch; the first branch arising some distance above the crown or burr; the upper part is more or less branched; the muffle is broad and naked; the suborbital gland and the pit in the skull are very small and shallow. Some species have a distinct tuft of hair on the outer side of the metatarsus, and more have the pencil of hair on the inner side of the hock, and others are without either; indeed in some specimens of the same species the tuft of hair on the hinder legs are very visible, in others very indistinctly or not at all seen.

11. CAPREOLUS (*H. Smith*), CAPRÆA (*Ogilby*), HIPPOCAMELUS (*Leuckart*), CERVEQUUS (*Lesson*),

has nearly erect, small, cylindrical, slightly branched horns, with a very short peduncle; they have no tail, but a large, white anal disk, a very indistinct tear-bag, and narrow triangular hoofs; the tuft on the hind-legs rather above the middle of the metatarsus; they are covered with thick brittle hair in winter, and thinner and more flexible hair in the summer; the adults are not spotted, and have a black spot at the angle of the mouth; the skull has a very small, shallow suborbital pit. Found in Europe, North Asia, and South America.

The ROEBUCK. *Capreolus Capræa*.

Inside of the ears fulvous; summer, red brown; winter, olive, pale punctated; horns short.

Capræa, Plin.—Gesner.—*Capreolus*, Brisson.—*Cervus capreolus*, Linn.—Pallas, Zool. Ross. A. i. 219.—*Capreolus Capræa*, Gray, Cat. Osteol. B. M. 64.—*Capreolus Europæus*, Sundeval, Pecora, 61.—*Roe Buck*, Penn.—*Chevreuril* and *Chevrette*, Buffon, H. N. vi. 198.

Inhabits Europe. A larger variety is said to have formerly inhabited the Tyrol.

The AHU. *Capreolus pygargus*.

Interior of the ears fulvous; fur pale yellowish; horns elongate.

Cervus pygargus, Pallas, Reise, i. 97, 198, 433, ii. 159; Spic. xii. 7 (not Hardwicke).—Schreb. S. v. t. 253.—*C. capreolus* β, Pallas, Zool. Ross. Asiat. i. 219.—*Cervus Ahu*, Gmelin, Reis. iii. 496. t. 56.—Griffith, A. K. iv. 122. t. —*Capreolus pygargus*, Sundeval, Pecora, 61.—*Tailless Deer*, Penn. Quad. i. 121.—*Tailless Roe*, Shaw.

Inhabits Central Asia. Collection of the British Museum.

The GEMUL OR AMERICAN ROE. *Capreolus? Huamel*.

Inside of the ears white; fur dark, closely yellow punctated.

Equus bisulcus, Molina, Chili, 520.—Fischer, Syn. Mamm. 430.—*Auchenia Huamel*, H. Smith, G. A. K. v. 764.—*Cervus Chilensis*, Gay et Gervais, Ann. Sci. Nat. 1846, 91.—*Cloven-footed Horse*, Shaw, Zool. ii. 441.—*Guemul*, Chilians.—*Gemuel* seu *Huemul*, Vidaure, Chili, iv. 87.—*Camelus equinus*, Triverianus, Mus. Biol. ii. 179.—*Hippocamelus dubius*, Leuckart de Equo bisulco, 24. 1816.—*Cervequis andicus*, Lesson, Nov. Tab. R. A. 173.—*Cervus (Capreolus) leucotis*, Gray, Proc. Zool. Soc. 1849, 64. t. 12.

Inhabits mountains on East Coast of America.

The female American Roe in Lord Derby's Museum at Knowsley is considerably larger, and has the legs thicker, than the Siberian *Ahu*, which is much larger than the European Roe Buck.

12. CARIACUS (Gray), MAZAMA (Sundeval), MAZAMA, part (H. Smith),

has cylindrical arched horns, with a central, internal snag, the tip bent forwards, and with the lower branches on the hinder edge; they are covered with soft thin hair, have a moderate tail furnished with long hair on the under side, a white anal disk, rather elongated, large, rounded ears; they generally have a tuft of white hair on the outer side of the hind-leg, rather below the middle of the metacarpus, but it is sometimes not to be seen; the skull has a very small, shallow, suborbital pit, and the nasal bone is broad and subtriangular behind; the tail is elongate, slender, pale, with the lower part dark, and reaching nearly to the hocks in summer; much shorter and broader, and all dark olive in the winter. Confined to Northern America.

* Some have the hoofs narrow, elongate; tail hairy beneath.

The AMERICAN DEER. *Cariacus Virginianus*. TAB. XLVI., in winter coat.

Bright fulvous in summer, greyer in winter; tail fulvous above, the tip black, beneath white; carried erect when running; nose brown; side of mouth white, with an oblique black band from the nostrils; hoofs narrow, elongate.

Dama Virginiana, Rafi Syn. 86.—*Fallow Deer*, Lawson, Carol. 23.—Catesby, Carol. App. 28.—*Cervus Dama Americanus*, Erxl. Syst. 312.—*Cervus Mexicanus*, Licht. Darstell. t. 20.—*Cervus Strongyloceros*, part, Schreb. Saugth. 1074, not figure.—*Cervus campestris (Mazame)*, F. Cuv. Mam. Lithog. t. —*Cervus Virginianus*, Gmelin, S. N. i. 179.—Desm. Mamm. 442.—F. Cuvier, Mam. Lithog. t. 205.—*C. Mangivorus*, Schrank, Ann. Wetter. i. 327, 1819, from Buffon.—*C. (Mazama) Virginiana*, Bennett, Gard. Z. S. 205.—Fischer, Syn. 449.—Peale, U. S. Explor. Exped. 39.—Sundeval, Pecora, 58.—*Cervus leucurus, Long-tailed Deer*, Douglas, Zool. Journ. xv. 330.—Richardson, Faun. Bor. Amer. i. 258.—*C. Mazama leucurus*, Sundeval, Pecora, 59.—*Cariacus virginianus, C. leucurus*, and *C. mexicanus*, Gray, Cat. Osteol. B. M. 63, 64.—*Virginian Deer*, Penn. Syn. 51. t. 9. f. 2; Quad. i. 104. t. 11. f. 1.—*Cerf de La Louisiane*, Cuvier, R. A. i. 256; Oss. Foss. iv. 33. t. 5. f. 1-5.—*Chevreuril*, Chalev. Nouv. Fran. iii. 152.—*Cariacou*, Buffon, H. N. xiii. 347. t. 44.

Mr. Peale observes,—“We believe that the same species of Deer inhabits all the timbered or partially timbered country between the Coast of the Atlantic and Pacific Oceans. They vary in size, as all the animals of this genus do, in different feeding grounds, but they are specifically the same.” The Mexican

Deer (Penn. Syn. 54. t. 9. f. 3, and Quad. i. 20), *Cervus Mexicanus* (Gmelin, S. N. i. 179; H. Smith, G. A. K. v. 729, iv. 130. t. ; Cuvier, Oss. Foss. iv. t. 5. f. 23), *Cervus ramosicornis* (Blainville), are all described from horns, which only appear to be much-developed horns of this species which have belonged to some well-fed animals.

The horns described and figured as *C. clavatus* (H. Smith, G. A. K. iv. 132. t.), appear to be only varieties of the common form.

1. The *Cervus Mexicanus* (Lichten. Darst. t. 20; Sundeval, Pecora, 59),
2. The *Cervus nemoralis* (H. Smith, G. A. K. iv. 157. t. ; Sundeval, Pecora, 59),
3. The *Cervus gymnotis* (Wiegmann, Isis, 1833; Sundeval, Pecora, 59),

all from Mexico, appear to be varieties of this species. *C. Mexicanus* is said to have a brown tail and indistinct chin-band. The nakedness of the ears, which is peculiar to *C. gymnotis*, is often to be observed in these animals when in change of fur.

Lord Derby writes:—

“I am glad to say, one of the Texian Does has produced a pair of horns. The young, I hear, are very beautifully marked. My other Texian Doe is also pregnant.”—May 24, 1844.

“We have lost the male Texian Deer, and have now only one female. It was quite well, and jumping about the old aviary yard yesterday, and was found this morning with its thigh broke and the foot of the other leg dislocated, but no wound whatever beside to cause its death. He was one of the twins bred here about nine months back.”

The BLACK-TAILED DEER. *Cariacus Lewisii*. TAB. XLIV., summer; XLV., winter fur.

The tail black above towards the extremity, yellowish white beneath, covered with hair at all seasons, not carried erect when running; fulvous (in summer); hair very soft, not ringed; forehead and upper part of face before the eyes blackish; inside of the legs and belly white; chin-band distinct, black; front hoofs narrow, elongate. Horns like *C. Virginianus*, but generally more slender, and commonly without the first antler.

Black-tailed Deer, Anglo-American in Oregon.—*Black-tailed Fallow Deer*, Lewis and Clerk, Travels to the Pacific, ii. 26, 125 (London edit. 1807).—*Cervus macrotis* β . *Colombiana*, Richardson, Fauna Bor. Amer. i. 257.—*Long-tailed Deer* (*Cervus macrourus*), H. Smith, G. A. K. iv. 134, v. 795, part.—Fischer, Syn. 615.—*Cervus Lewisii*, J. Peale, U. S. Explor. Exped. 39. t. 9, ined. fig. at p. 43, fore-foot.

Inhabits N. W. Coast of N. America.

Lord Derby observes,—“The *Black-tailed Doe* was also enceinte when she died.”—May 24, 1844.

The CALIFORNIAN ROE. *Cariacus punctulatus*.

Dark reddish brown (in summer), minutely punctulated by the yellow tips of the hair; chin-mark distinct; ears elongated, nakedish; base of the ears, orbits, round the muzzle, under side of tail, and the upper part of the inside of the leg, white; forehead, line down the face, and narrow streak on upper part of the nape black; legs brown; a very narrow, indistinct streak on the middle line of the rump yellowish; tail like back, with a blackish tip.

Inhabits California.

There is a female of this species in the Zoological Gardens. It is much smaller than the Black-tailed Deer, and darker than *C. Virginianus*, and it differs in the hair being dark, with a distinct yellow sub-terminal band.

** Others have the front hoof broad cordate; tail not hairy beneath.

The MULE DEER. *Cariacus macrotis*.

Brownish fulvous; chin without any or only an indistinct band; tail pale ferruginous, with a black tuft at the end, and without any hair beneath; ears very large; hoofs of the fore-feet broad cordate, nearly as broad as long, flattened and concave beneath; horns larger and more spreading than in *C. Virginianus*.

Mule Deer, Anglo-Americans of the Rocky Mountains.—? *Mule* or *Black-tailed Deer*, Le Raye.—Lewis and Clerk, Travels.—Wied, Voy. Amer. Merid. iii. 273, and Vig. A, B.—*Cervus macrotis*, Say, Long, Exped. Rocky Mount. ii. 88.—H. Smith, G. A. K. v. 794.—Fischer, Syn. 444, 615.—Sundeval, Pecora, 59.—Richardson, Faun. Bor. Amer. 254. t. 20.—Peale, U. S. Expl. Exped. 41. t. 10 (ined.), fig. at p. 43, fore-feet.—*C. auritus*, Desm. Dict. Class. H. N. iii. 379.

Inhabits N. W. America; Arakansa.

13. BLASTOCERUS (*Wagner, Sundev.*), MAZAMA, sp. (*H. Smith*),

has straight, erect, three-branched horns, without any basal snag; a very short tail, and rather large ears; are covered with very thin soft hair; they have a distinct pencil of hairs on the inside of the hock, but none on the outside of the metatarsus. Confined to Tropical America.

The GUAZU-PUCO. *Blastocerus paludosus*.

Fulvous; orbit, sides of muzzle, belly and under side of tail white; face-marks and feet blackish.

Cervus paludosus, Desm. Mamm. 443.—H. Smith, iv. 134. t. . v. 796.—Fischer, Syn. 444, 616.—Licht. Darst. t. 17.—Sundev. Pecora, 59.—*C. palustris*, Desmoul. Dict. Class. H. N. iii. 379.—? *Mazama furcata*, Gray, Cat. Osteol. B. M. 64.—*Cervus dichotomus* (*Guatzupucu*), Illiger, Abhand. Akad. d. W. 1804–1811, 117.—Pr. Max. Neuw. Isis, 1821, 650. t. 6.

Inhabits Brazils.

14. FURCIFER (*Wagner, Sundev.*), MAZAMA, part (*Gray, H. Smith*),

has erect, forked horns, without any basal snag; narrow acute ears; a short tail; covered with thick, rather brittle, waved hairs; there is a distinct pencil of hairs on the inside of the hock, but none on the outer sides of the metatarsus. Confined to South America.

The MAZAME OR GUAZUTI. *Furcifer campestris*.

Fulvous brown; the hairs of the lower part of the nape and front of the back reversed; the hoofs narrow. Young: middle of back not spotted; sides with small white spots, the upper series forming a regular line.

Mazame, Hernandez, Mex.—Buffon, H. N. xii. 317.—*Veado branco*, *Veado campo*, Anchieta, Notic. i. 127.—*Cervus bezoarticus*, Linn. S. N. ed. 10. 67.—*C. campestris*, F. Cuvier, Dict. Sci. Nat. vii. 484?—Cuvier, Oss. Foss. iv. 51. t. 5. f. 46, 48.—*C. campestris*, Licht. Darst. t. 19.—Pr. Max. Abbild. t. .—Darwin, Zool. Beagle, 29. fig. horns.—H. Smith, G. A. K. iv. 136. t. . v. 797.—*C. leucogaster*, Goldf. Schreb. Saugth. 1127.—*Mazama campestris*, H. Smith.—Gray, Cat. Osteol. B. M. 64.—*Biche de Savanne*, Buffon, Supp. iii. 126.—*Gouazouti*, Azara, Essai, i. 77.

Inhabits S. America; N. Patagonia. Collection of British Museum.

The figure of *C. campestris* in F. Cuvier, Mamm. Lithog., is evidently a *Cariacus*, and not of this genus.

The TARUSH OR TARUGA. *Furcifer Antisiensis*.

Yellow grey; hairs rigid, quilled, brown, with a yellow subterminal ring; edge of muffle and throat white; face with a brown longitudinal streak, and a lyrate band between the eyes; the hoofs rather broad, worn in front.

Cervus Antisiensis, D'Orbigny, Voy. Amer. Merid.; Dict. Univ. H. N. iii. 328.—Tschudi, Faun. Peru, t. 18.—Sundev. Pecora, 60.

Inhabits S. America; Bolivian Alps.

15. COASSUS (*Gray*), SUBULO (*H. Smith, Sundeval*),

has simple, rudimentary, erect horns; rather short, broad, rounded ears; a short tail; the facial line rather convex; the fur short, of the forehead (in both sexes) elongate, forming a rhombic tuft between the horns and face; legs without any tuft on the outside of the metatarsus, or pencil on the inside of the hocks. Confined to S. America.

Dr. Sundeval describes *C. rufus* as having a pencil of hairs on the inner side of the hocks. I cannot find them in our dry specimens, but they are shown in Mr. Hawkins' drawing from the living animal.

The CUGUACU-APARA. *Coassus nemorivagus*. TAB. XLVIII.

Pale brown; the hair dull-coloured, brown, with a yellow subterminal band which wears off; a paler spot over the eyes. Young: brown, white spotted; spots of sides unequal; nape dark.

Cervus nemorivagus, F. Cuvier, Dict. Sci. Nat. vii. 485.—Cuvier, Oss. Foss. iv. 54. t. 5. f. 50.—Fischer, Syn. 446, 618.—H. Smith, G. A. K. iv. 142. t. .—Sundev. Pecora, 60.—Licht. Darstel. t. 21.—*Coassus nemorivagus*, Gray, Cat. Osteol. B. M. 64.—*Cervus nemorum*, Desm. Mamm. 446.—*C. simplicicornis*, Illiger, Pr. Max. Abbild. t. .—Young? *Moschus delicatula*, Shaw, Mus. Lever. t. 36.

The CUGUACU-ETE OF PITA. *Coassus rufus*. TAB. XLVII.

The fur bright shining red; crown and neck grey; sides of face and chest paler. Young: reddish, white spotted, spots of side unequal; nape with a distinct white-edged dark central streak.

Var. With white rings above the hoofs.

Cervus rufus, F. Cuvier, Dict. Sci. Nat. vii. 485.—Cuvier, Oss. Foss. iv. 53. t. 3. f. 41, 42, t. 5. f. 44.—H. Smith, G. A. K. iv. 140. t. —Pr. Max. Abbild. t. —Fischer, Syn. 446, 618.—Licht. Darst. t. 20.—Sundeval, Pecora, 60.—*Cervus simplicicornis* (*Apara* β.), H. Smith, G. A. K. iv. 141. t. —*C. dolichurus*, Wagner, Supp. iv. 389.—*Cariacou de la Guyane*, Buffon, ix. 90.—*Biche rouge*, Buffon, Supp. iii. 126.—*Gouazou pita*, Azara.

Inhabits S. America.

The male cast the horns during the time that Mr. Hawkins was making the drawing in the month of September, and they were very shortly replaced by a new pair.

Lord Derby observes:—

“We have just had another loss, about which I am very doubtful whether or no it would be any gain to you; it is a young *fawn*, that was produced on Sunday last. It is a cross-bred thing, having been got by the Deer that Schomburgk sent to me from Guiana by the name of *Savannah Deer* (*C. rufus*), and out of a female which you may recollect seeing in the old Aviary Yard—her with her ears cropped, which was sent by Mr. Bridges (*C. Pudu*). I do not make out the species of either parent, and therefore doubt if it would be any object to you any more than to me.

“Bridges sent me lately two small *Deer*, males, which we think belong to a female that I have had from Schomburgk by the name of the *Savannah Deer*. Hawkins has drawn them; but the female is about eighteen, the males about three months or so. We take them to be the *Pita Brochet*.”

The VENADA. *Coassus Pudu*.

Fur rufous, blackish in front and darker behind, and on the forehead and lower part of the leg; hairs ringed, of cheeks and neck greyish, of forehead and ears bright rufous; ears short; tail very short.

Cervus humilis, Bennett, P. Z. S. 1831, 27. fem.—Sundev. Pecora, 60.—*C. rufus*, Wagner, Supp. iv.—*Capra Pudu*, Molina.—*Chevreuril*, Poeppig, Froriep's Notiz. 1829.—Férussac, Bull. Sci. xix. 95.—*Cervus Pudu*, Gervais, Ann. Sci. Nat. 1846, 90.—*Antilope* (*Mazama*) *Temmamazama*, H. Smith, G. A. K. iv. 291?

Inhabits Chili; Conception and Chiloe (*King*).

THE HORSES.

THE genus EQUUS, as established by most authors, may be naturally divided into two separate groups. The species of the two groups, that is to say, the Horse and the Zebras, breed together freely in confinement, but the produce is almost always (if not always) barren.

EQUUS (*Gray*), The HORSE,

has the tail covered with hair to the root; the fur is marked or dappled with round pale spots, leaving a dark net-like ground. Both the fore and hind-legs are furnished with hard, horny bodies, called warts or chestnuts, on the inner side, they are placed above the knees on the fore-legs and below the hocks on the hinder ones.

The HORSE. *Equus Caballus*.

Equus antiquorum, Gesner, Quad. 132.—*Equus Caballus*, Linn. S. N. i. 100.—Pallas, Z. R. A. i. 255.—Gray, Zool. Journ. i. 243.—*Equus* v. *Equa*, Plin. H. N.—Gesner.—*Horse*, Penn. B. Z. i.—*Generous Horse*, Penn. Quad.—*Cheval*, Buffon, H. N. iv. 174.—Cuvier, R. A. i. 243.—*Pferd*, Ridinger.—*Ross*, Schrank.

Var. *Equiferus*, Pallas, Zool. Ross. Asiat. i. 260.—Eichw. Faun. Casp. Cour. 29.—*Wild Pferde*, S. G. Gmelin, Reise Rusland, i. 44. t. 9 (cop. Shaw, Zool. t. 414.—Schreb. t. 109).—Pallas, Reise, i. 211.—*Takija* or *Wild Horses*, Hanway, Hist. Caspian Sea, i. 349.—Bell, Travels, i. 212.

The figure of the *Wild Horse*, as given by Gmelin, very much resembles the Ponies left at liberty on the commons of Cornwall and mountains of Scotland. It appears very doubtful, if they are not rather to be considered as domestic horses which have escaped and deteriorated. Pallas observes that the very young are easily tamed, but the adult never (Z. R. A. 260). It is to be observed that this is not the case with the Horses which have become semi-wild in the rich prairies of America, where they have retained the size and form of the well-bred Horse.

Pallas described three varieties:—

1. Horse with a curled moustache on the upper lip (Spic. Zool. xi. 5. t. 5. f. 6; Zool. Ross. Asiat. i. 250).
2. Horse covered with curled woolly hair (Falk. Itiner. iii. 529.—Pallas, Zool. Ross. Asiat. i. 250).
3. Naked Horse of a beautiful form (Pallas, Zool. Ross. Asiat. i. 250).
4. White, with very close, minute, orbicular, brown spots, called *Argamaki* in Bocharis.

ASINUS (*Gray*), The ZEBRAS,

have the upper part of the tail covered with short hair and the lower part covered with longer hair, forming a tuft, the fur marked with darker stripes; the fore-legs only furnished with hard, horny warts, situated in a similar situation to those in the front-legs of the Horse; but there are none on the lower part of the hinder legs.

The WILD KINDS have moderately long, rounded ears, and are of a nearly uniform size. The TAME or DOMESTICATED KIND have elongated, acute ears, and they vary greatly in size and appearance according to the climate, being large and smooth-haired in the warmer, and small and shaggy in the colder countries.

It is very doubtful if the Domestic Ass is found in a truly wild state. The animals which have been described as Wild appear rather to be domestic animals which have escaped, or Mules between the Domestic

Ass and a Wild species. When taken, they appear, after a short time, to submit themselves to man, which is not the case with what I have considered the truly Wild kind.

Pallas justly observes,—“ In extensis Asiæ desertis primam patriam esse quærendam *Equiferi* et *Onagri* a Nomadibus in domesticos usus domatorum, æque ac Hemioni hactenus indomiti ” (Zool. Ross. A. i. 255). This is equally applicable to the African species.

The ASSES OF ASIA are nearly uniformly coloured with a dark, longitudinal dorsal stripe ; some have a black stripe across the shoulders.

The Ass. *Asinus vulgaris*.

Grey, with a longitudinal dorsal streak and a dark streak across the shoulders ; skull with suborbital foramen, as in *E. Kiang*.

Equus Onager, Pallas, Everm. Proc. Soc. Imp. Nat. Mosc. 1840, 56.—*Equus Asinus*, Linn.—Pallas, Zool. R. A. i. 263.—*Equus asina*, Fleming, Phil. Zool. ii.—*Asinus vulgaris*, Gray, Zool. Journ. i. 244.—*Asinus* and *A. sylvestris*, Plin. Hist. Nat. viii. 44.—*Ass*, Penn.—Berwick.—*Asne*, Buffon.—*Âne*, Cuvier.

Var. ? *Onager*, Plin. H. N. viii. 44.—Raii Quad. 6.—*E. Asinus Onager*, Schreb. Saugth. t. 312.—*Equus Onager*, Brisson.—*Wild Ass*, Bell, Travels, i. 212.—*Koulán* or *Wild Ass*, Penn. Quad.

Pallas, in a paper entitled “ Observations sur l’Asne dans son état sauvage, ou sur le véritable Onagre des Anciens ” (Act. Acad. Sci. Imp. Petrop. 1777, 258. t. 11), figured a Wild Ass which was sent by sea from Derbent to Astracan. The figure greatly resembles the mule between the *Hemione* and the *Ass* now in the Zoological Gardens, but the ears appear a trifle longer. It is coloured in the same manner as the *Hemione* ; that is to say, the more prominent parts of the body are dark, and the middle of the back, the front of the haunches and thigh, and the under part of the body, are paler. The figure represents but a very indistinct cross band on the shoulder ; indeed on this point Pallas observes,—“ L’étalon différerait encore de la femelle en ce qu’il avait tout le corps plus robuste, l’encolure plus grosse, le poitrail et la croupe plus large, et surtout par un barre ou raye transversale (tab. 11) qui croisait sur les épaules avec celle que s’étend de long de l’épine dans l’un et l’autre sexe. C’est cette croix que la plupart des ânes domestiques mâles ont conservé, et qui embellit surtout ceux qui ont la couleur du poile claire. Cette barre transversale, bien plus étroite que l’autre, manque entièrement aux Onagres femelles : quelques Tatares m’ont au contraire assuré qu’elle se voyant assez souvent double dans les mâles.”—*l. c.* 269.

This paper is translated into German, and a copy of the plates with a second figure of the back of the animal is given in Pallas (N. Nord. Beytr. ii. 22. t. 2), but in this figure the cross band on the shoulders is not at all marked.

From this description it would appear that the animal which is called the *Wild Ass* is not always marked with the cross band on the shoulder which is so permanent in the Domestic kind, and has hitherto been considered as its specific character.

The chief difference between Pallas’s figure of the *Wild Ass* and the *Hemione* is the greater length and more acute form of the ears ; mules vary in the latter character.

I have seen a specimen of the usual grey colour, without any appearance of the cross. They are sometimes black, at others white, and are rarely piebald ; but this is the Common Albinism and Melanism of Domestic Animals, when of these colours the cross band is not apparent, or only to be seen when the animal is observed obliquely. Many Domestic Asses have the legs more or less distinctly cross-banded, especially near the hock.

The ICKTA OR HEMIONE. *Asinus Hemionus*.

Fur short, smooth, pale reddish (in winter long, rather woolly, greyish), with a longitudinal black dorsal streak, widest over the small of the back ; no cross shoulder band ; skull with the infra-orbital foramen high up, about one-third the space between the face-line and the back edge of the teeth, far back, being directly over the front end of the cheek-ridge and the back edge of the third grinder.

Mulus dauricus fecundus, Misserchm. MSS.—*Equus Hemionus*, Pallas, Nov. Com. Petrop. xix. 394. t. 7, copied Neue Nord Beytr. ii. 22. t. 1, good ; Reise, iii. 217, cop. Schreber, Saugth. t. 311.—Gray, Proc. Zool. Soc. 1849, 29.—I. Geoff. Nouv. Ann. Mus. H. N. t. —Eichw. Faun. Casp. Caur.—*Equus Hemionos*, Bodd.—*Asinus Hemionus*, Gray, Zool. Journ. i. 244.—*Wild Ass of Kutch and the Indus*, Sykes, Proc. Zool. Soc. 1837, 91.—*Onager*, Barboza, Collect. Ramusio, i. 300 b.—*Ickta*, Shaw, Zool. ii. 427.—*Dshikketei*, Penn.—*Dziggetai*, Cuvier, R. A. i. 244.—*Dzigithai*, Buffon, Supp. vi. 37.—*Wild Mule, Half Ass or Fecund Mule*, Penn. Quad. i.—*Hemionos*, Plin. Hist. Nat. viii. c. 44.—*L’Hémione*, Ency. Méthod. t. 43. f. 4.

Inhabits India, Cutch, Persia.

The KIANG. *Asinus Kiang*.

Fur short, smooth, pale reddish (in winter long, rather woolly, greyish), with a broad, longitudinal dorsal streak, broadest over the small of the back, without any cross band on shoulder. Skull: the infraorbital foramen low down, in the centre of the space between the face-line and the base of the teeth, and placed in a line over the back edge of the second grinder, some distance in front of the end of the cheek-ridge.

Equus Kiang, Lesson, Manuel.—Gray, Proc. Zool. Soc. 1849, 29.—*Asinus polyodon*, Hodgson, Calcutta Journ. N. H. 1847, 469. t. 6, animal and skull.

Inhabits Thibet.

A fine specimen in the British Museum, presented by Lord Gifford, and several skulls presented by Mr. Hodgson.

The ZEBRAS OF SOUTH AFRICA have, besides the black dorsal streak, many more or less distinct transverse or curved streaks on the body; they have rather short, broad-tipped ears.

Those which live on the open plains have rather expanded hoofs, slightly concave beneath, and the legs not streaked.

The QUAGGA. *Asinus Quagga*.

Head, neck and back brown; head, neck and withers blackish streaked; lower part of body, legs and tail white; hoofs flattish beneath.

Equus Quagga, Gmelin, S. N. i. 213.—Schreb. Saugth. t. 317.—F. Cuvier, Dict. Sci. Nat. vii. 473. t. .—Harris, W. A. A. t. 2.—*Asinus Quagga*, Gray, Zool. Journ. i. 246.—*Female Zebra*, Edw. Glean. i. t. 223.—*Le Couagga*, Buffon, H. N. Supp. iii. t. 4.—Cuvier, Menag. Mus. t. .—F. Cuvier, Mamm. Lith. t. .—*Kwagga* or *Couagga*, Buff. Supp. vi. 85.—*Opeagha* or *Quagga*, Masson, Phil. Trans. lxvi. 297.—*Quagga*, Shaw, Zool. ii. 240.—*Quacha*, Penn. Quad. i. 14.

Inhabits Cape of Good Hope, in open plains.

The PEETSI OR PEECHI. *Asinus Burchellii*.

Pale brown; under side of body whitish; head, body and upper part of legs black streaked; tail, inside and lower part of legs white; hoofs rather broad, only slightly concave beneath. Skull: suborbital foramen as in *E. Hemionus*.

Equus Zebra, Burchell, Travels, i. 139. vig. at p. 252.—*Asinus Burchellii*, Gray, Zool. Journ. ii. 247. t. 9. f. 1. animal, f. 2. hoof, 1824.—*Equus Zebroides*, Lesson, Man. 346.—*Equus Burchellii*, Fischer, Syn. Mamm. 432.—*Equa Zebra* (male), Cuvier, Menag. Mus. t. .—*Equus montanus* (*Le Daow*), F. Cuvier, Mamm. Lith. t. . female and foal (not Burchell).—*Burchell's Zebra*, Harris, W. A. A. t. 5.—*Striped* or *Bonte Quagga*, Cape Colonists, Harris, l. c. 7.—*Peet-sey* of the Matabuli and Bechianas.—*Daow*, F. Cuvier, Mamm. Lith. t. .

Inhabits S. Africa, in open plains.

M. F. Cuvier has applied the Hottentot name for the True Zebra to this species, and uses for it the later name that Burchell gave to that animal, *E. montanus*, though it only inhabits the plains.

Those which live on the mountains have narrow hoofs, deeply concave beneath, and the legs are banded.

The ZEBRA. *Asinus Zebra*.

White; head, body, and legs to the hoofs black-banded; nose reddish; belly and inside of thighs not banded; tail, end blackish; hoofs narrow, deeply concave beneath. Skull: suborbital foramen as in *E. Hemionus*.

Zebra Indica, Aldrov. Solid. 416. fig.—Raii Syn. 64.—*Equus Indicus*, Jonston, Quad. t. 5.—*E. Brasiliensis*, Jacob. Mus. Reg. 3. t. 2. f. 1.—*Hippotigris*, Dio Cass. Hist. l. 77.—*Equus Zebra*, Linn. S. N. i. 101.—Schreb. Saugth. t. 316.—*Asinus Zebra*, Gray, Zool. Journ. ii. 248. t. 9. f. 3, hoofs.—*Equus montanus*, Burchell, Travels, i. 139, 265, ii. 270.—Harris, W. A. Afr. t. 24. f. 1.—*Male Zebra*, Edwards, Glean. i. t. 222.—*Zèbre*, Buffon, H. N. xii. t. 12.—*Zebra*, Raii Quad. 69.—Penn.—*Sebra*, Stubb.—*Wild Paard* or *Wild Horse*, Dutch Colonists, Burchell's Trav.—Harris, l. c. 7.—*Daow* (or *True Zebra*), Cape Colonists.—Harris, l. c. 7.—*Wilder Esel*, Kolbe.—*Zewra* or *Zuora*, Lobo, Abyss. i. 291?—*Wild Ass*, Kolben, Cape, ii. 112.

Mules or Hybrids of the different species of Horses.

1. The COMMON MULE, the hybrid between the *Ass* and the *Mare*.

Mules, Raii Quad. 64.—*Equus asinus Mulus*, Gmelin.—*Equus Mulus*, Schreb. t. 214.—*Mule*, Pennant.—*Grand Mulet*, Buffon, H. N. iv. t. 12.—*Maulthier*, Bechstein.

2. The HINNY, the hybrid between the *Horse* and the *She-Ass*.

Hinnus, Arist. H. A. i. c. 7.—*Equus asinus Hinnus*, Gmelin.—*Equus Hinnus*, Schreb. t. 215.—*Petit Mulet*, Buffon, H. N. iv. t. 13.—*Maulesel*, Bechst.

3. Mule of a male *Hemione* and a female *Zebra*. TAB. LVII. fig. 1.

The shoulders and legs are banded.

The specimen is now preserved in the Collection of the British Museum. It was bred at Knowsley.

4. Mule of a male *Maltese Ass* and a *Zebra*. TAB. LVII. fig. 2.

The body and legs are striped; the stripes on the head and body are narrow, except the shoulder cross, which is very distinct and forked; the rump is covered with small spots.

Ribbon-legged Ass (*Asinus vulgaris*, var. *fasciata*), Gray, Zool. Journ. i. 245.

The skin of this animal is also preserved in the British Museum Collection. It was bred at Windsor Park.

5. Mule between a male *Ass* and a *Zebra*.

Grey indistinct cross, and a few narrow dark stripes on the shoulders and fore-legs; tail elongate, end tufted, upper part slightly banded; ears moderate.

Métis femelle d'Ane et de Zebra, F. Cuvier, Mamm. Lith. t. 9.

This is very different from the Mule with the *Maltese Ass*. It has scarcely any stripes.

6. Mule between a male? *Burchell's Zebra* and a common *Ass*. TAB. LVIII. fig. 1.

Grey, with very indistinct bands on the front of the back; a more distinct, short, narrow cross-band, divided into three below, and with some black cross-bands on the outside of the legs.

This animal was used to draw in a tandem. The skin is now in the British Museum.

7. Mule between a male common *Ass* and an *Hemione*. TAB. LVIII. fig. 2.

It is very like the mother, but has a distinct black cross-band and some indistinct cross-bands on the outside of the hocks and knees.

This animal is now living in the Gardens of the Zoological Society. It changes its colour and becomes greyer in winter, like its female parent. I have seen another example of this Mule, exactly like the one here described.

8. Mule between an *Hemione* and a *Burchell's Zebra*. TAB. LIX. fig. 1.

Reddish grey; head, neck and front part of the body with very narrow rather darker streaks.

Double Mules.

9. The offspring of a Mule (the produce of a male *Ass* and a *Zebra*) with a bay mare *Pony*. TAB. LIX. fig. 2.

Iron-grey; with a short narrow cross-band on withers, very faint indications of stripes on the sides, and more distinct dark stripes on outsides of the hocks and knees; tail bushy from the base, like a Horse; head heavy; mane brown and grey.

This animal is used to draw a small cart. It stands 8 hands high.

“*Common Zebra*.—Of this species I have for some years possessed a female, whom, as she was often in use, and I possessed then no male of her own kind, I allowed to pair with a male *Dshikketei*, who had previously copulated with a female of the *Burchell's Zebra*. Each of the mares produced by him a female

foal, of which that out of the *Burchellii* was the handsomest, and is still in my possession (1845). That out of the *Common Zebra* I sent to the Zoological Society of London (in). In 1842 I purchased of Mr. Herring a male *Zebra*, by whom, in May 1844, the female had a fine young male, which I now possess, and the mother is again expected to produce. Since that time, the *Dshikketei*, both for the purpose of the experiment and for the convenience of accommodation, has been turned out into the same paddock with his daughter by the *Burchellian* and with a female *Quagga*, both of whom he has covered, and the latter is now heavy in foal, but the hybrid not so. Thus I expect ere long to be able to prove that the *Wild Ass* or *Dshikketei* will not only copulate, but breed with each of the three kinds of *Zebra*; though it does not as yet afford the desired proof of their intimate connection, if not identity, as the hybrid out of the *Zebra*, and that out of the *Burchellian* species, which much the more strongly of the two resembled the sire, has proved barren. The young male *Zebra* is a very fine animal, and was as a foal of most rapid growth, being quite equal to the mother in size at about six months, and now considerably larger. While very young the stripes were not black, but decidedly fulvous, and continued so till about the time I have above named.

"I find I have made some errors in this paper. The hybrid sent to the Park was the handsomest in marks, but not in symmetry. It is also still living. The young male *Zebra* was foaled May 23, 1844. The mother took the male on June 3, 1844, but did not hold; again July 18, 1845; and as they go with young about a year, she should produce again in July 1846. The foal equalled the mother not so early as I have said, but at about ten months. He is now not so *large*, but higher than she."

"The *Zebra* foaled at last, last night. It is a female. Both mother and young are doing well."—May 24, 1844.

"Can you tell me how long a *Zebra* is in a state of pregnancy? mine has gone more than a week over the twelve months. The *Eland* is in the seventeenth month; and the *Leucoryx* is pregnant, of which we are not sure, about four or five."—June 6, 1844.

"It was a curious coincidence that you should receive so nearly the acquisition of the father and one of his daughters. The other, of the same year as yours, I have now here. She has been in the paddock all the last season with her sire, in order to try if they would breed together; but though we know he copulated with his companion, a female *Quagga* (and we were in hopes she was in foal), we do not entertain any such expectations of the daughter, whose mother, I think, was the *Burchell's Zebra* and the dam of that you have, the *Common Zebra*, who we hope will ere long produce another legitimate produce by her own male. Her son of that year is become a very fine animal."

LIST OF PLATES.

N.B. When more than one figure is on the Plates, the one to the left hand is regarded as figure 1.

-
- PLATE I. fig. 1, 2. The Impoon. *Cephalophus Grimmia*, p. 8. South Africa.
fig. 3. The Black-faced Philantomba. *Cephalophus Campbelliæ*, p. 9. South Africa.
- II. fig. 1, 2. The Impoon. *Cephalophus Grimmia*, p. 8. Head in detail.
fig. 3. The Black-faced Philantomba. *Cephalophus Campbelliæ*, p. 9. Head in detail.
- III. The Gazelle. *Gazella Dorcas*, var. *Cuvieri*, p. 4. Male and females. Morocco.
- IV. The Korin. *Gazella rufifrons*, p. 5. Two males and females and fawn. Gambia.
- V. The Gibari. *Scopophorus montanus*, p. 7. Female. Gambia.
- VI. fig. 1, 2. The Red-crowned Bush Goat. *Cephalophus coronatus*, p. 9. Gambia.
fig. 3. The Coquetoön. *Cephalophus rufilatus*, p. 10. Sierra Leone.
- VII. fig. 1. The Bay Bush Goat. *Cephalophus dorsalis*, p. 10. Sierra Leone.
fig. 2. The Black Bush Goat. *Cephalophus niger*, p. 10. Sierra Leone.
- VIII. fig. 1. The White-backed Bush Goat. *Cephalophus sylvicultrix*, p. 10 (named by mistake *C. punctulatus* on the Plate). Sierra Leone.
fig. 2. The Black-striped Bush Goat. *Cephalophus Ogilbii*, p. 10. Fernando Po.
- IX. The Coquetoön (heads). *Cephalophus rufilatus*, p. 10. Gambia.
- X. The Black-rumped Guevei. *Cephalophus melanorhæus*, p. 11. Fernando Po.
- XI. fig. 1. The Grisled Guevei. *Cephalophus punctulatus*, p. 11. Sierra Leone.
fig. 2. The White-footed Guevei. *Cephalophus Whitfieldii*, p. 12. Gambia.
- XI. a. The Guevei. *Cephalophus Maxwellii*, p. 11. W. Africa.
- XII. The Rehbock. *Eleotragus capreolus*, p. 12. Female. Cape of Good Hope.
- XIII. The Nagor. *Eleotragus reduncus*, p. 13. Female and fawn. S. Africa.
- XIV. The Æquitoön. *Adenota Kob*, p. 14. Young. W. Africa.
- XV. The Æquitoön. *Adenota Kob*, p. 14 (lettered *Damalis* on the Plate). Male and female. W. Africa.
- XVI. fig. 1. The Oryx. *Oryx leucoryx*, p. 17. Young. North Africa.
fig. 2. The Kookaam. *Oryx Gazella*, p. 17. Young. Cape of Good Hope.
- XVII. The Oryx. *Oryx leucoryx*, p. 17. Adult male and female. N. Africa.
- XVIII. The Addax. *Addax nasomaculatus*, p. 17. N. Africa.
- XIX. fig. 1. The Gnu. *Catoblepas Gnu*, p. 19. Young. S. Africa.
fig. 2. The Gorgon. *Catoblepas Gorgon*, p. 20 (*Gorgon fasciatus* on the Plate). Young. South Africa.
- XX. fig. 1. The Bubale. *Boselaphus (Acronotus) Bubalis*, p. 20. Young.
fig. 2. The Lecama. *Boselaphus (Acronotus) Caama*, p. 20. Half-grown.
fig. 3. The Bonte Boc. *Damalis Pygarga*, p. 21. Young. S. Africa.
- XXI. The Korrigum. *Damalis (Acronotus) Senegalensis*, p. 21. Female and young. W. Africa.
- XXII. fig. 1. The Bless Bock. *Damalis albifrons*, p. 22. Half-grown. Cape of Good Hope.
fig. 2, 3. The Bonte Boc. *Damalis Pygarga*, p. 21. Half-grown. Cape of Good Hope.
- XXIII. fig. 1. The Euryceros. *Tragelaphus Euryceros*, p. 27. W. Africa? Head only.
fig. 2. The Gazelle. *Gazella Dorcas*, var. *Cuvieri*, p. 4. Morocco.
fig. 3. The Bush Goat. *Cephalophus sylvicultrix*, p. 10. Sierra Leone.
- XXIV. fig. 1. The Kookaam. *Oryx Gazella*, p. 17. Young. S. Africa.
fig. 2. The Koodoo. *Strepsiceros Kudu*, p. 26. Young. S. Africa.

- PLATE XXV. The Ging-e-Jonga. *Oreas Derbianus*, p. 27 (*Boselaphus Derbianus* on the Plate). Gambia.
Male and female.
- XXVI. The Eland. *Oreas Canna*, p. 27. Male and female. S. Africa.
- XXVII. The Eland. *Oreas Canna*, p. 27. Young and fawn. S. Africa.
- XXVIII. The Zalofes. *Tragelaphus scripta*, p. 28. Male and female.
- XXIX. The Nylghau. *Portax Tragocamelus*, p. 28. Half-grown and young. India.
- XXX. The Anoa. *Anoa depressicornis*, p. 47. Celebes.
- XXXI. The Boomorah. *Hyemoschus aquaticus*, p. 42. Male and female and young in winter.
W. Africa, Gambia.
- XXXII. The Meminna. *Meminna Indica*, p. 42. Mother and fawn. India, Ceylon.
- XXXIII. The Stanley Musk. *Tragulus Stanleyanus*, p. 43. Ceylon.
- XXXIV. The Kanchil. *Tragulus pygmeus*, p. 43. Mother and fawn in winter.
- XXXV. The Napu or Javan Musk. *Tragulus Javanicus*, p. 43. Male, female and fawn, summer.
- XXXVI. The Wapiti. *Cervus Canadensis*, p. 58. Winter. N. America.
- XXXVII. The Barbary Deer. *Cervus Barbarus*, p. 59. Stag, hind and fawn of the year. Tunis; in winter.
- XXXVIII. The Bara Singa. *Cervus Wallichii*, p. 60. Winter. Persia.
- XXXIX. The Bara Singa. *Cervus Wallichii*, p. 60. Summer. Persia.
- XL. The Bahraiya. *Rucervus Duvaucellii* (*C. Euryceros* on Plate), p. 61. Himalaya; in summer.
- XLI. The Bahraiya. *Rucervus Duvaucellii*, p. 61. Himalaya. Winter.
- XLII. The Porcine Deer, or the Lugna Para. *Hyelaphus porcinus*, p. 64. India.
- XLIII. The Equine Rusa. *Rusa Equinus*, p. 62. Autumn.
- XLIV. The Black-tailed Deer. *Cariacus Lewisii*, p. 67. N. America; in summer.
- XLV. The Black-tailed Deer. *Cariacus Lewisii*, p. 67. N. America; in winter: same as Tab. XLIV.
- XLVI. The Texian Deer. *Cariacus Virginianus*, p. 66. Var. ? N. America, Texas; in winter.
- XLVII. The Cuguacu-ete or Pita. *Coassus rufus*, p. 69. Autumn.
- XLVIII. The Cuguacu-apara. *Coassus nemorivagus*, p. 68. Autumn.
- XLIX. The Vicugna. *Lama Vicugna*, p. 52. S. America, Peru.
- L. The Guanaco. *Lama Huanaca*, p. 52. S. America, Peru.
- LI. The Lama. *Lama Glama*, p. 52. S. America. Summer.
- LII. The Alpaca. *Lama Pacos*, p. 53. Four females, a young male, and fawn 10 days old. S. America.
- LIII. The Dshizzetai or Ickta. *Asinus Hemionus*, p. 71. India, Cutch. Male and female. Male now
in British Museum.
- LIV. The Quagga. *Asinus Quagga*, p. 72. Cape of Good Hope. Male and female.
- LV. The Peetsi, or Burchell's Zebra. *Asinus Burchellii*, p. 72. Cape of Good Hope. Male and female.
- LVI. The Zebra. *Asinus Zebra*, p. 72. Cape of Good Hope. Male and female.
- LVII. Mules.
fig. 1. Mule of a male Hemione and a Zebra, p. 73. From Knowsley. Now in British Museum.
fig. 2. Mule of a male Maltese Ass and a Zebra, p. 73. Specimen in British Museum.
- LVIII. Mules.
fig. 1. Mule between a male ? Burchell's Zebra and a Common Ass, p. 73. In the Zoological
Gardens. Now in British Museum.
fig. 2. Mule between a Common Ass and a Hemione, p. 73. In the Zoological Gardens.
- LIX. Mules, and Double Mule.
fig. 1. Mule between a male Hemione and a Burchell's Zebra, p. 73.
fig. 2. Double Mule between a male (the offspring of a male Ass and a Zebra) and a bay mare
Pony, p. 73. Now in London streets.



Drawn from the living animals at Knowsley by B. Waterhouse Hawkins F.L.S.

TWO FEMALES

MALIB. PAULI. VAR.

Printed at 74, St. Martin's Lane

DOVER BOOKS - CHELSEA LONDON



Drawn on Stone by P. Waterhouse Hawkins from the living Animals at Kivuohy

GREY GAZELLE.—GAZELLA VERA.

Hulmandel & Walton Lithographers.





drawn from the LIVING ANIMAL at KNOWSLEY by Edwardes House Nov 1845

Hulmandel & Walton Lithographers.

GIBBARL-SCOPOPHORUS MONTANUS.



Hallmark & Walton Lithographers.

SINANI - CEPHALOPHUS CORONATUS

COQUITOON - CEPHALOPHUS RUPELLATUS



Fig. 108
Gmelin



DEER AND FAWN

PLATE 100

1871



Drawn from the living animals at Knowsley by B. Waterhouse Hawkins, F. L. S.

COQUILTED DEER. CEPHALOPHUS RUFILATUS.

Printed at 70 St. Martin's Lane.

Drawn from the living animal and by a better light than ever hitherto, J. L. S.

Printed by C. M. Wells and Co.

COQUETON. CEPHALOPHUS RUFILATUS.





Illustration of Cervidae

Illustration of Cervidae

CERVICAPRUS MELANORHINUS





Drawn from the living animals at Knowsley by B. Waterhouse Hawkins. F.L.S. &c

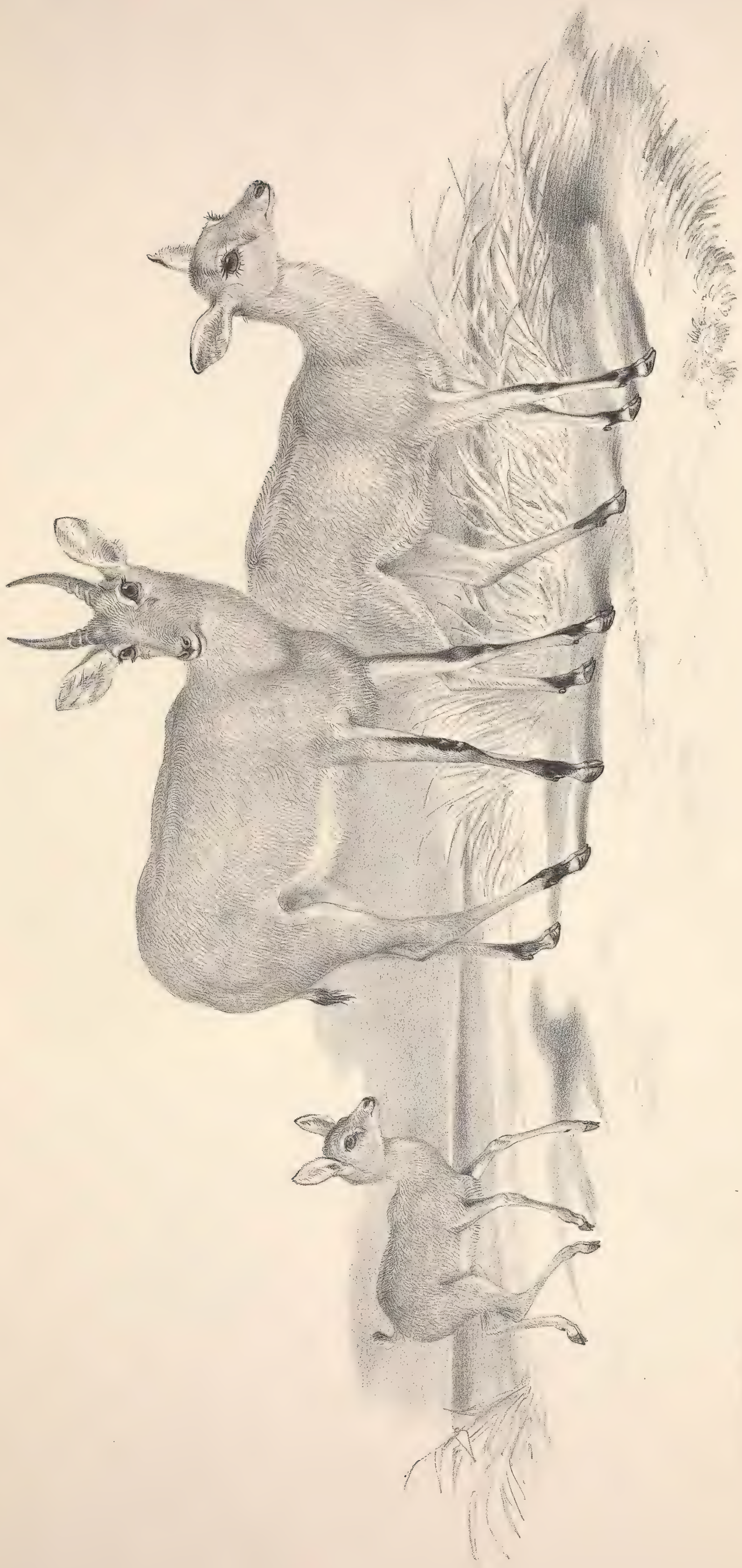
REHBOCK. - ELEOTRAGUS CAPREOLUS.



B. Waurhouse Hawkins del. & lith.

Printed by McLean & Co. 70, St. Martin's Lane.

NAGOR - ELOTRAGUS REDUNCUS



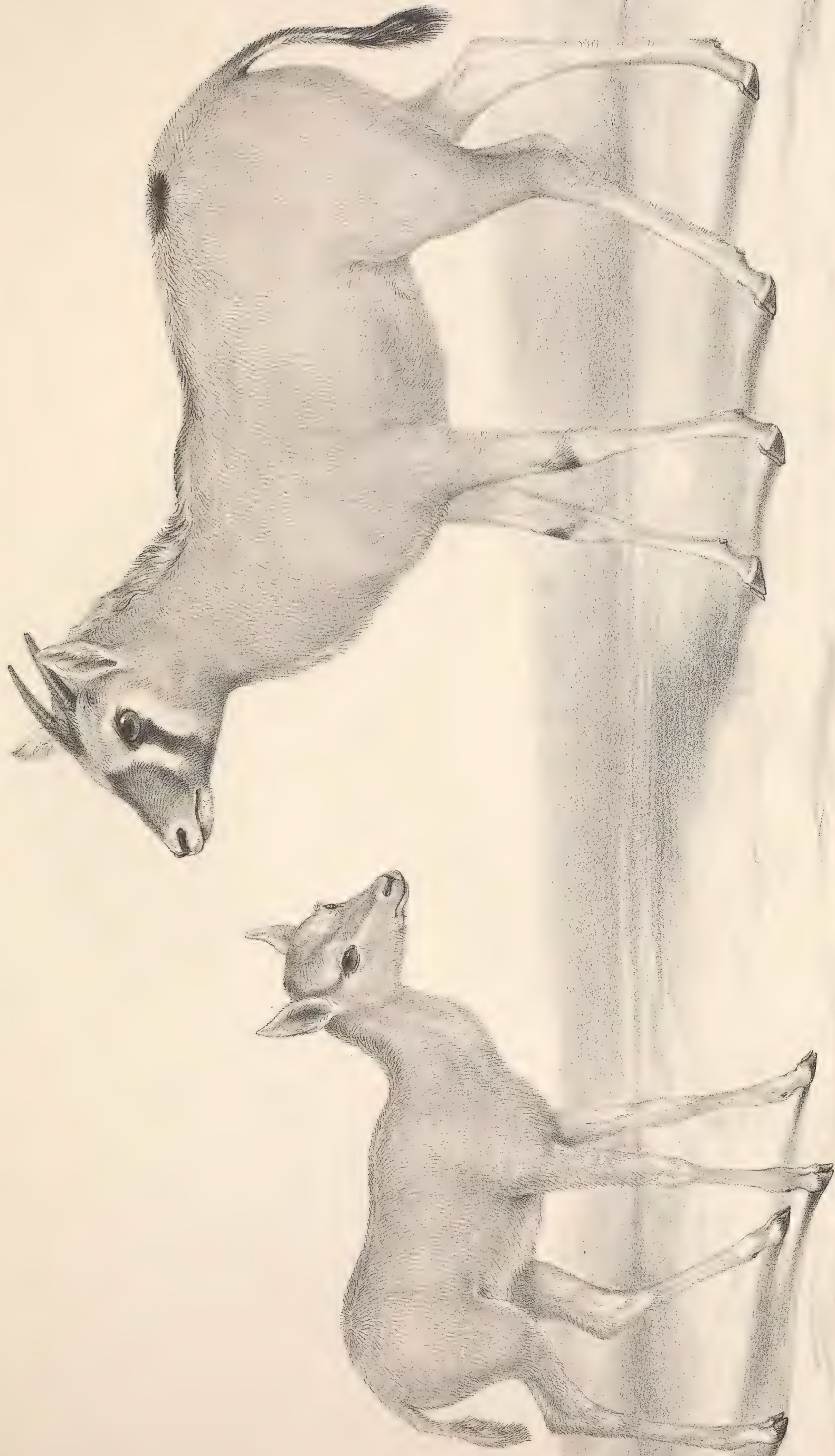
Printed by W. E. Leam & Co. 70, St. Martin's Lane

AQUITOON. ADENOTA KOB



From a life sketch by Mr. J. G. Thompson

ÆQUETOON ——— DAMALIS



3. Waterhouse Harbours del. 1. 10

Printed by McLean & Co 70 St. Marks Lane



Drawn & Engraved from the LIVING ANIMALS - at Koororley - by
B. Waterhouse Hawkins 1846

ADDAX - ORYX NASOMACULATUS.



Printed by M. L. L. & Co. No. 10, 8, Market Lane

ELBIE - ACROLOTUS N. P. 1815
(Young)

ELBIE - ACROLOTUS N. P. 1815
(Young)

ELBIE - ACROLOTUS N. P. 1815
(Young)





Waterhouse Hawkins del. & lith.

Engraved by M. Leakey & Co. London.

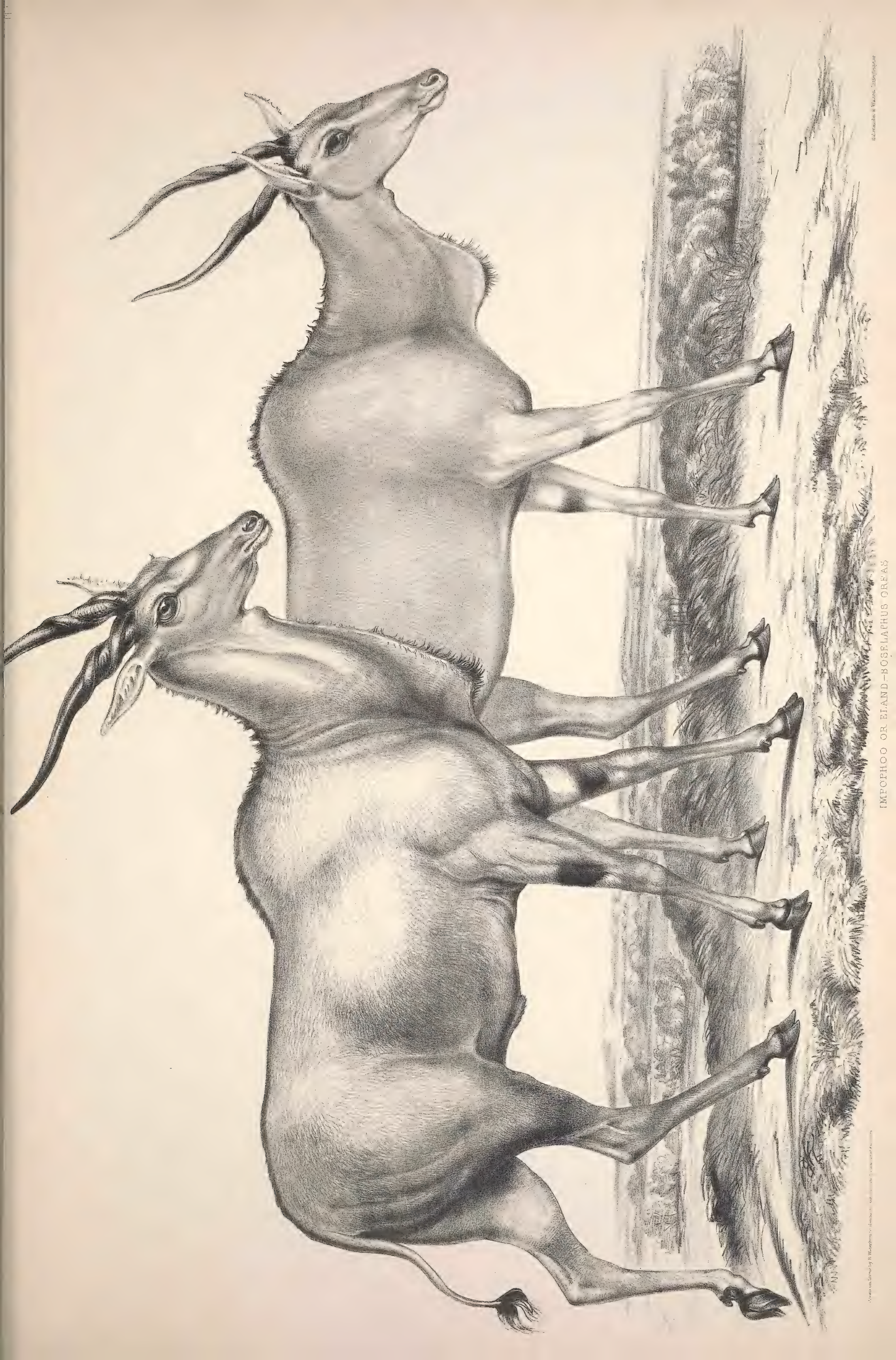
1. STREPTICEROS EURYCEPHUS 2. GAZELLA CUVIERI
3. CEPHALOPHUS SVINICULTRIX



ORYX GAZELLA (JUN.)

EUDICOTYLES KUDU (JUN.)





IMPOPHOO OR ELAND-BOSSELAPHUS ORCAS

Illustrated by W. H. B. 1871



DRAWN FROM THE LIVING ANIMALS BY J. KNOWSLEY DEL. BY W. WATERHOUSE SCULPT. — SITING JUNE 1846

THE IMPOPHOO OR ELAND.—BOSELAPHUS OREAS



Drawn on Stone by P. Waterhouse Hawkins

GIBE OH-HARNES ANTELOPE.—*TRAGELAPHUS SCRIPTUS*

Engraved & Colored by G. Agnew & Sons



B. Waterhouse Hawkins del. & hft.

Printed by M. Egan & Co. 77 N. Market St. N. Y.

RECHART - ROCKY MOUNTAIN



Drawn on Stone by B. Waterhouse Hawkins.

ANOA-ANOA DEPRESSICORNIS

Published by Walter L. H. & Co., New York.



THE BOOMORAH. HYEMOSCHUS AQUATICUS



MOSCHUS. - MEMINA INDICA



Drawn from the living animal at Princeton by *Blodgett House* *Franklin*
Dec 21. 1844

STANLEY MUSEUM PRINCETON STANLEYANUS



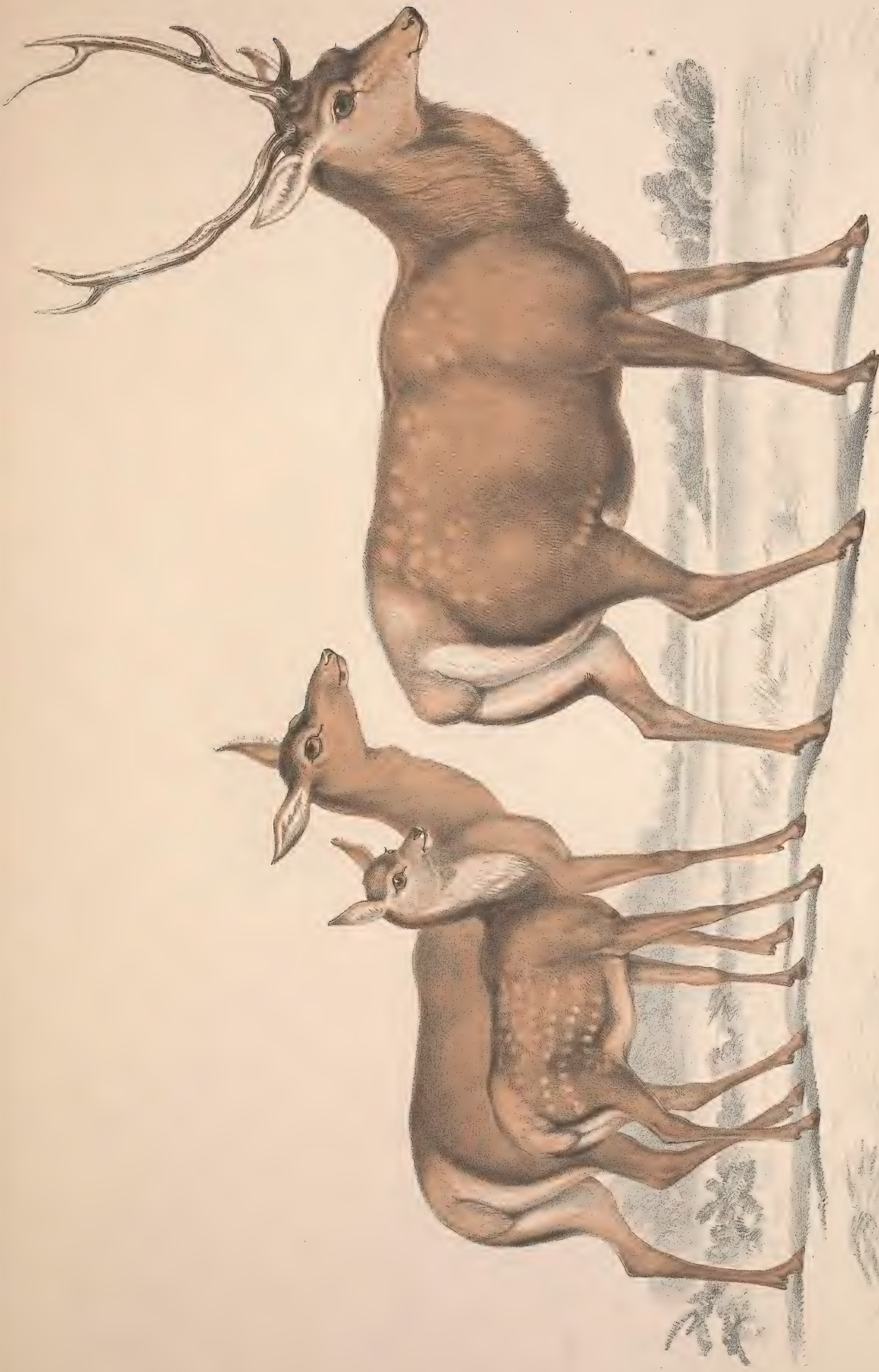
Animals of the Piney Woods at Keweenaw Aug. 1895 by B. S. Henshaw, Henshaw.



WAPITI. CERVUS STRONGYLOCEROS

Printed by McLean & Co. 70, St. Martin's Lane.

B. Watkinson Hawkins del & lith.



B Waterhouse Hawkins del & lith.

BARBARY DEER CERVUS BARBARUS
SUMMER.

Printed by McLean & Co 70 St Martin's Lane.



B Waterhouse Hawkins del & lith.

PERSIAN DEER CERVUS MARAL

WINTER

Printed by M^cLean & Co. 70. St Martin's Lane.



B Waterhouse Hawkins del & lith.

PERSIAN DEER CERVUS MARAL

Printed by M^c Lean & 70, St Martin's Lane.



B Waterhouse Hawkins del & Lith.

INDIAN STAG CERVUS EUCEROS

Printed by W. S. Lean & Co 70 St. Martin's Lane.



HIDIA STAG CERVA S EL CERVO
VINTRE

Illustration of a Stag (Cervus) in winter.

Illustration of a Stag (Cervus) in winter.



Drawn from the Living Animals at Knovsley by B Waterhouse Hawkins.

PORCINE DEER. HYELAPHUS PORCINUS

Printed by McLean & Co. 70, St. Martin's Lane.





B Waterhouse, Hawkins del & Lith.

BLACK TAILED AMERICAN DEER, MAZAMA VIRGINIANA.

N. AMERICA

SUMMER. JULY.

Printed by M^r Lean & Co. 70 St. Martin's Lane



B Waterhouse Hawkins del & Lith.

BLACK TAILED AMERICAN DEER, MAZAMA VIRGINIANA.

N AMERICA. WINTER, MARCH.

Printed by J. J. Young & Co. New York.



B Waterhouse Hawkins del. & lith.

TEXIAN DEER MAZAMA MEXICANA

WINTER JANUARY

Printed by M^c Lean Co. 70. St. Martin's Lane.



B. Waterhouse Hawkins, del. & lith.

BROCHET COASSUS RUFUS

MALE & FEMALE SEPTEMBER

Printed by M^r. Lean & Co. 70. St. Martin's Lane.





EYELIPOWED BROCKET

COASSUS SUPERCILIARIS





from the Living Animals at Knowsley Oct 1844 by E. H. HARRIS

PLATE 1

GUANACO - LLAMA - GUANACO
May 1844

PLATE 1



From the Living Animals at Townsend's Waterhouse Harbours Dec. 1844



Living Animals as known by the Indians of the Andes



È Venerabile e Illustrissimo del R. S. M.

Printed by McLean & Co 701 Broadway, N.Y.



Drawn from the living animals at Kowesley by B. Waterhouse Hawkins

QUAGGA . . ASSINUS QUAGGA .

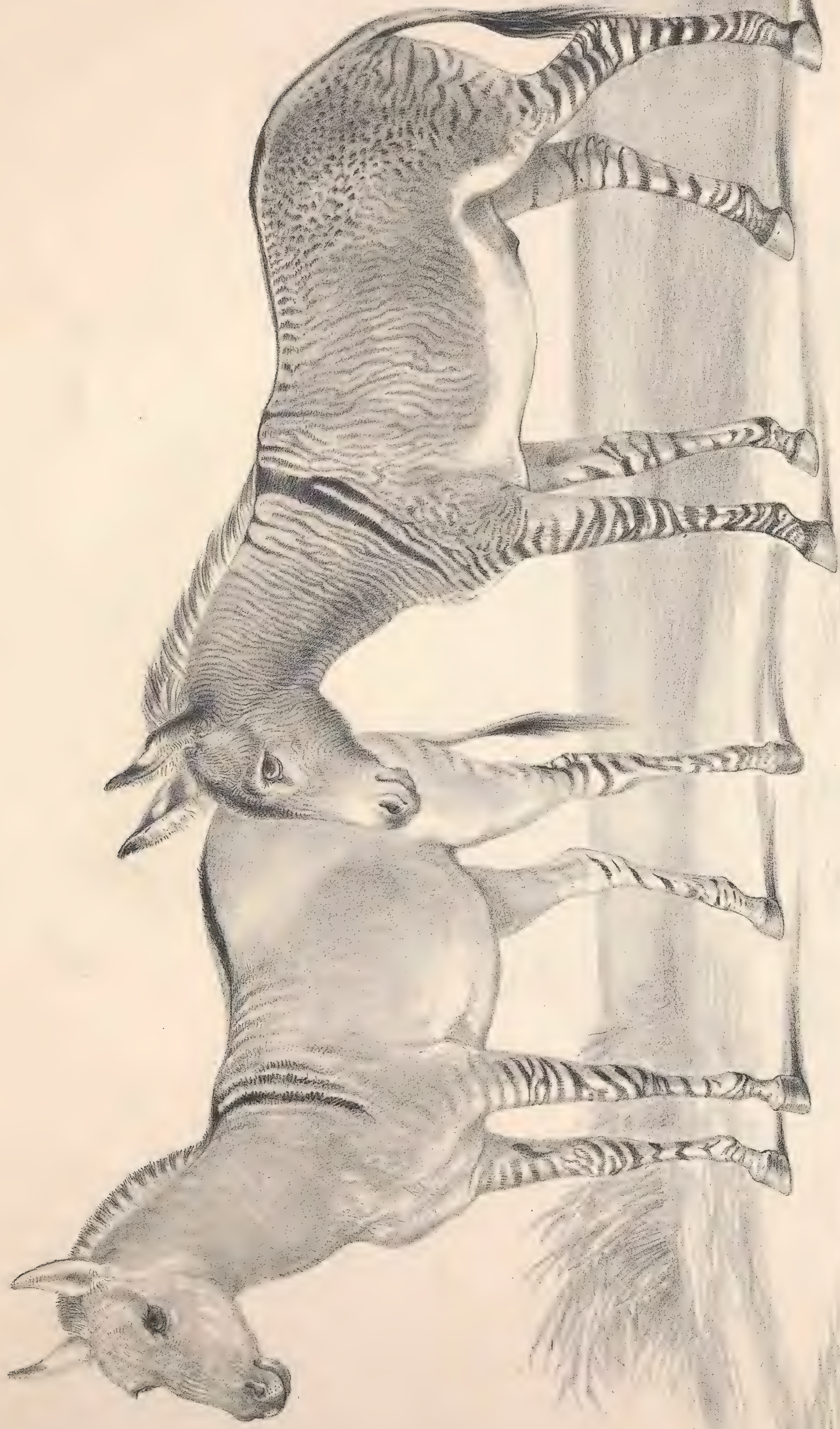
Printed at 70 St. Martin's Lane



Drawn from the Living Animals at Robinson's Bay 1846 by Mr. Edward H. Harkness

THE ZEBRA - EQUUS Burchelli





Engraved by J. G. Thompson.

MULE. — A. CYLAUPTIS AND A. ZEBRA.

MULE. — HEMIIONUS AND ZEBRA.



B. Waterhouse Hawkins del. & lith

MULE. - A. SYLVESTRIS AND HEMIORUS.

MULE. - A. SYLVESTRIS AND A. PIPICHILLI.

Printed by W. J. W. & Co. 70 St. Martin's Lane.



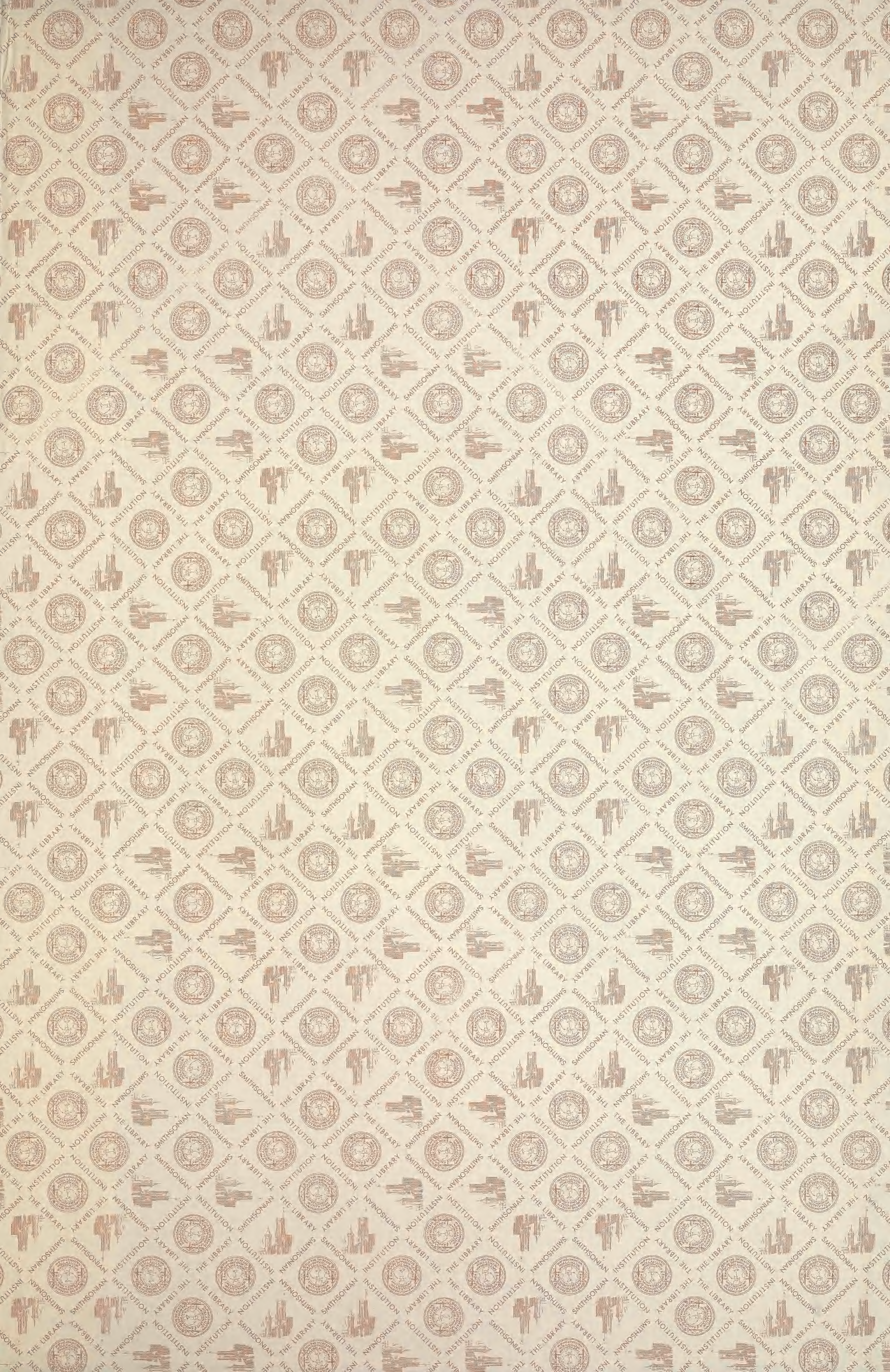
Printed by H. K. & L.

MULE HEMIONUS & BURCHELL'S ZEBRA.

MULE - For a Mule's Boy Mule.

Printed by H. K. & L.





SMITHSONIAN INSTITUTION LIBRARIES
3 9086 00439644 6
v. 2 Gleanings from the menagerie and